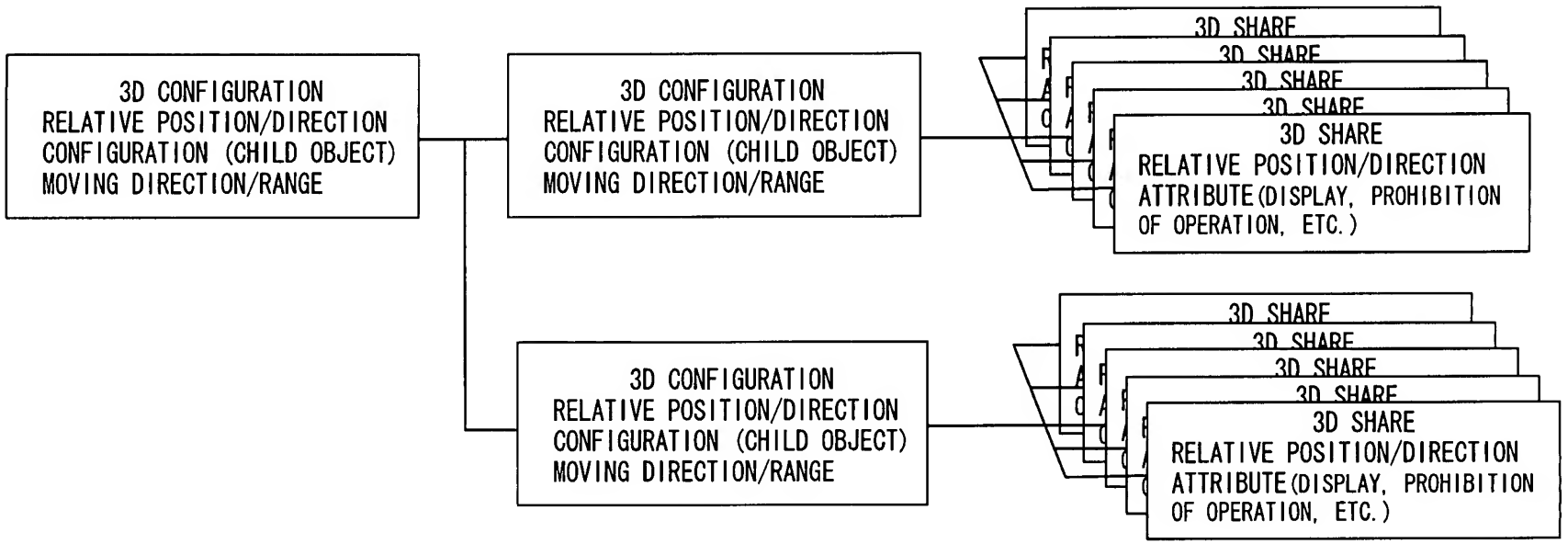
3D CONFIGURATION
RELATIVE POSITION/DIRECTION
CONFIGURATION (CHILD OBJECT)
MOVING DIRECTION/RANGE
3D CONFIGURATION
RELATIVE POSITION/DIRECTION
CONFIGURATION (CHILD OBJECT)
MOVING DIRECTION/RANGE
3D SHARE
3D SHARE
3D SHARE
3D SHARE
3D SHARE
RELATIVE POSITION/DIRECTION
ATTRIBUTE (DISPLAY, PROHIBITION OF OPERATION, ETC.)
3D CONFIGURATION
RELATIVE POSITION/DIRECTION
CONFIGURATION (CHILD OBJECT)
MOVING DIRECTION/RANGE
3D SHARE
3D SHARE
3D SHARE
3D SHARE
3D SHARE
RELATIVE POSITION/DIRECTION
ATTRIBUTE (DISPLAY, PROHIBITION OF OPERATION, ETC.)

FIG. 1

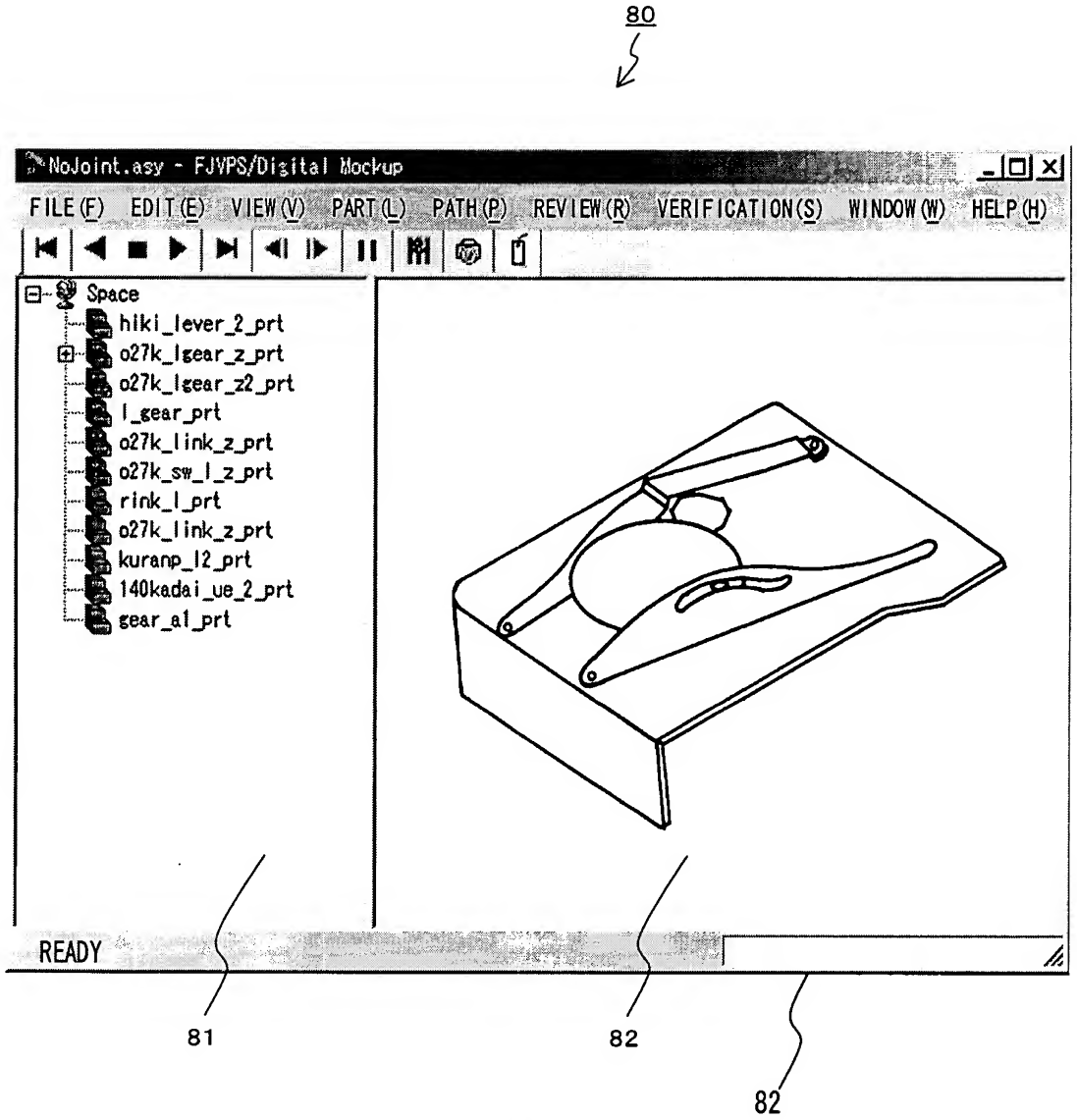
80
NoJoint.asy - FJVPS/Digital Mockup
FILE(F) EDIT(E) VIEW(V) PART(L) PATH(P) REVIEW(R) VERIFICATION(S) WINDOW(W) HELP(H)
Space
hiki_lever_2_prt
o27k_lgear_z_prt
o27k_lgear_z2_prt
l_gear_prt
o27k_link_z_prt
o27k_sw_l_z_prt
rink_l_prt
o27k_link_z_prt
kuranp_l2_prt
140kadai_ue_2_prt
gear_a1_prt
READY
81
82
82

FIG. 2

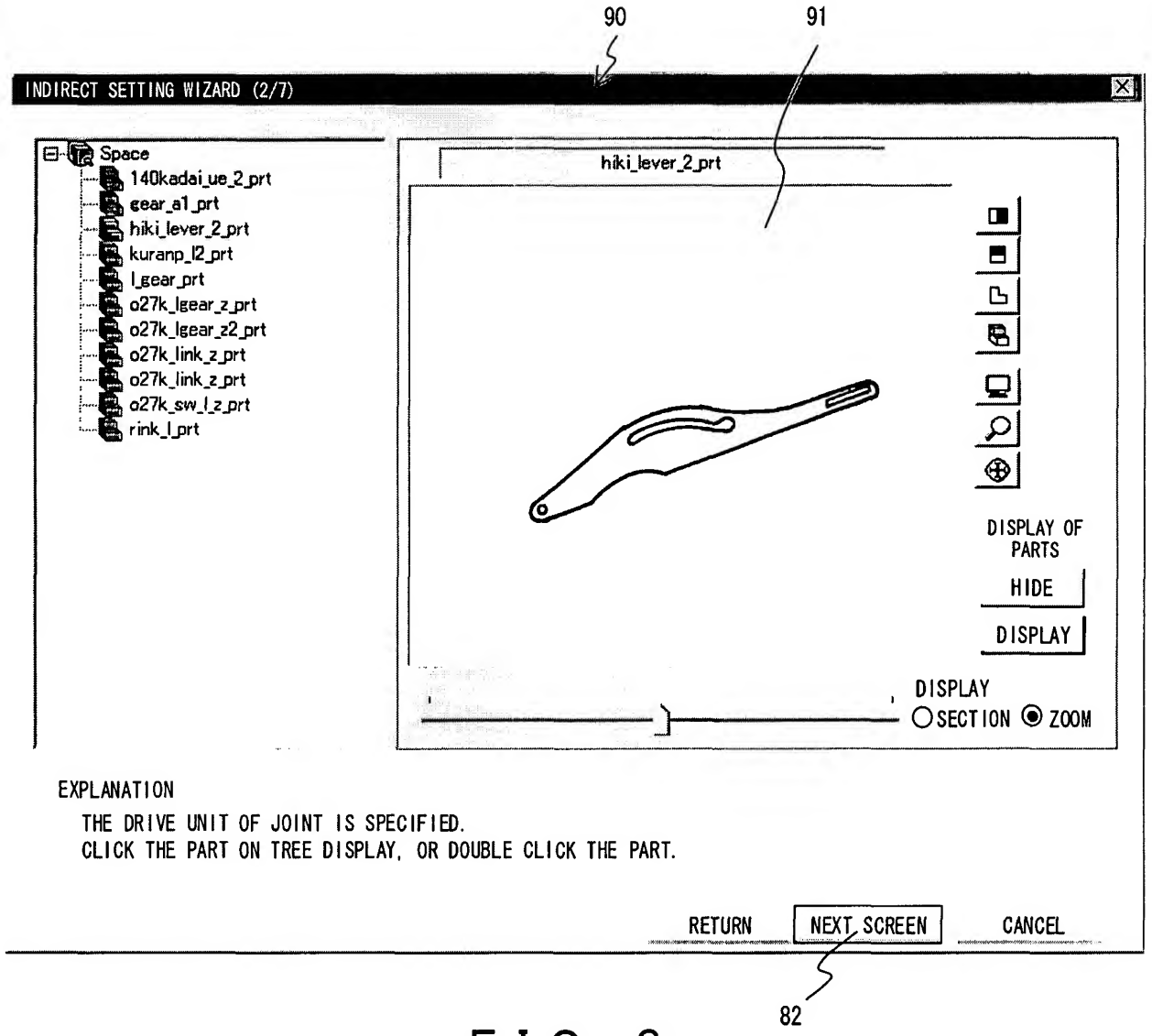
90
91
INDIRECT SETTING WIZARD (2/7)
Space
140kadai_ue_2_prt
gear_a1_prt
hiki_lever_2_prt
kuranp_l2_prt
l_gear_prt
o27k_lgear_z_prt
o27k_lgear_z2_prt
o27k_link_z_prt
o27k_link_z_prt
o27k_sw_l_z_prt
rink_l_prt
hiki_lever_2_prt
DISPLAY OF PARTS
HIDE
DISPLAY
DISPLAY
SECTION
ZOOM
EXPLANATION
THE DRIVE UNIT OF JOINT IS SPECIFIED.
CLICK THE PART ON TREE DISPLAY, OR DOUBLE CLICK THE PART.
RETURN
NEXT SCREEN
CANCEL
82

FIG. 3

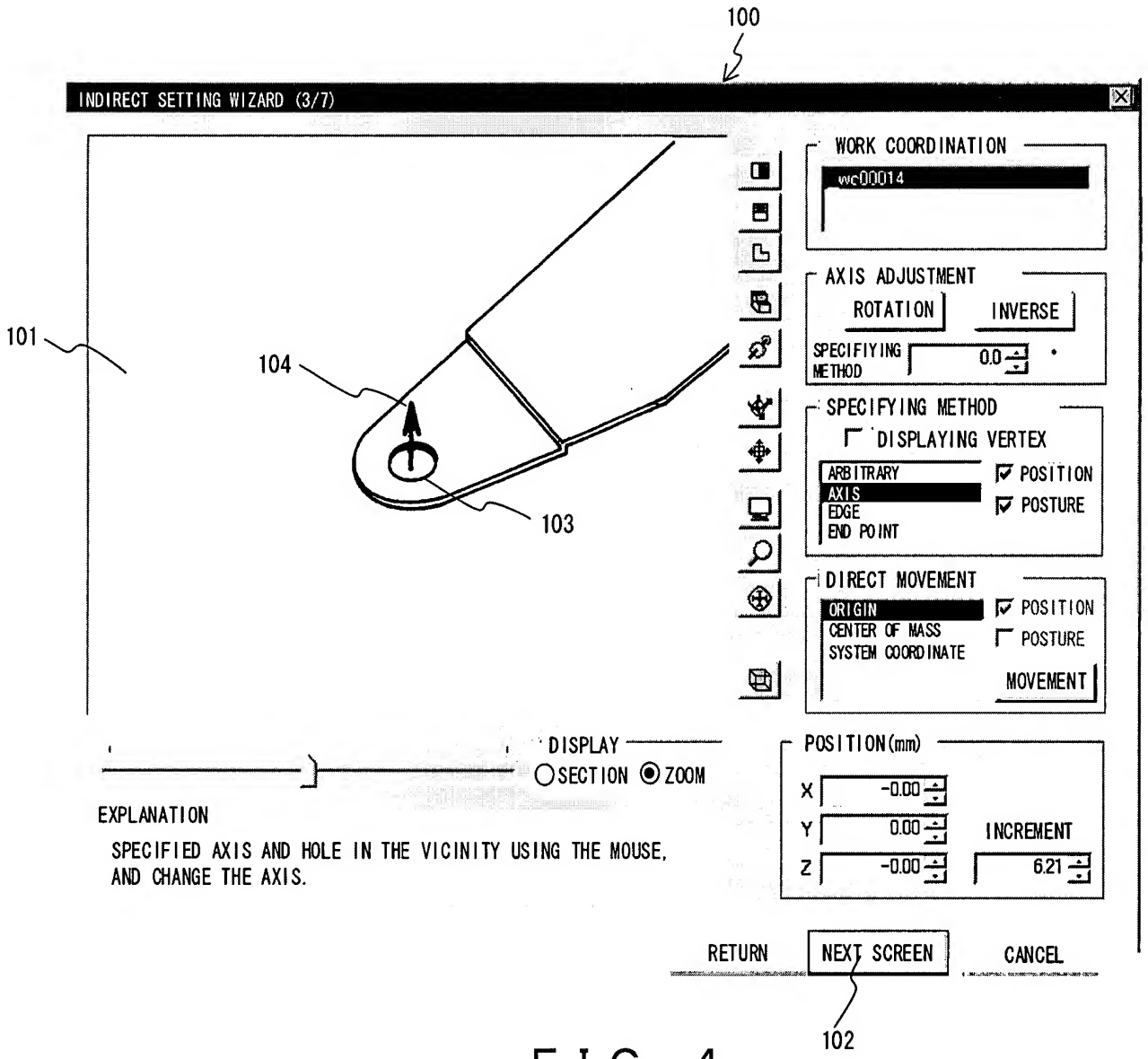
100
INDIRECT SETTING WIZARD (3/7)
101
104
103
WORK COORDINATION
wc00014
AXIS ADJUSTMENT
ROTATION
INVERSE
SPECIFIYING METHOD
0.0
SPECIFYING METHOD
DISPLAYING VERTEX
ARBITRARY
AXIS
EDGE
END POINT
POSITION
POSTURE
DIRECT MOVEMENT
ORIGIN
CENTER OF MASS
SYSTEM COORDINATE
POSITION
POSTURE
MOVEMENT
DISPLAY
SECTION
ZOOM
POSITION(mm)
X
-0.00
Y
0.00
Z
-0.00
INCREMENT
6.21
EXPLANATION
SPECIFIED AXIS AND HOLE IN THE VICINITY USING THE MOUSE, AND CHANGE THE AXIS.
RETURN
NEXT SCREEN
CANCEL
102

FIG. 4

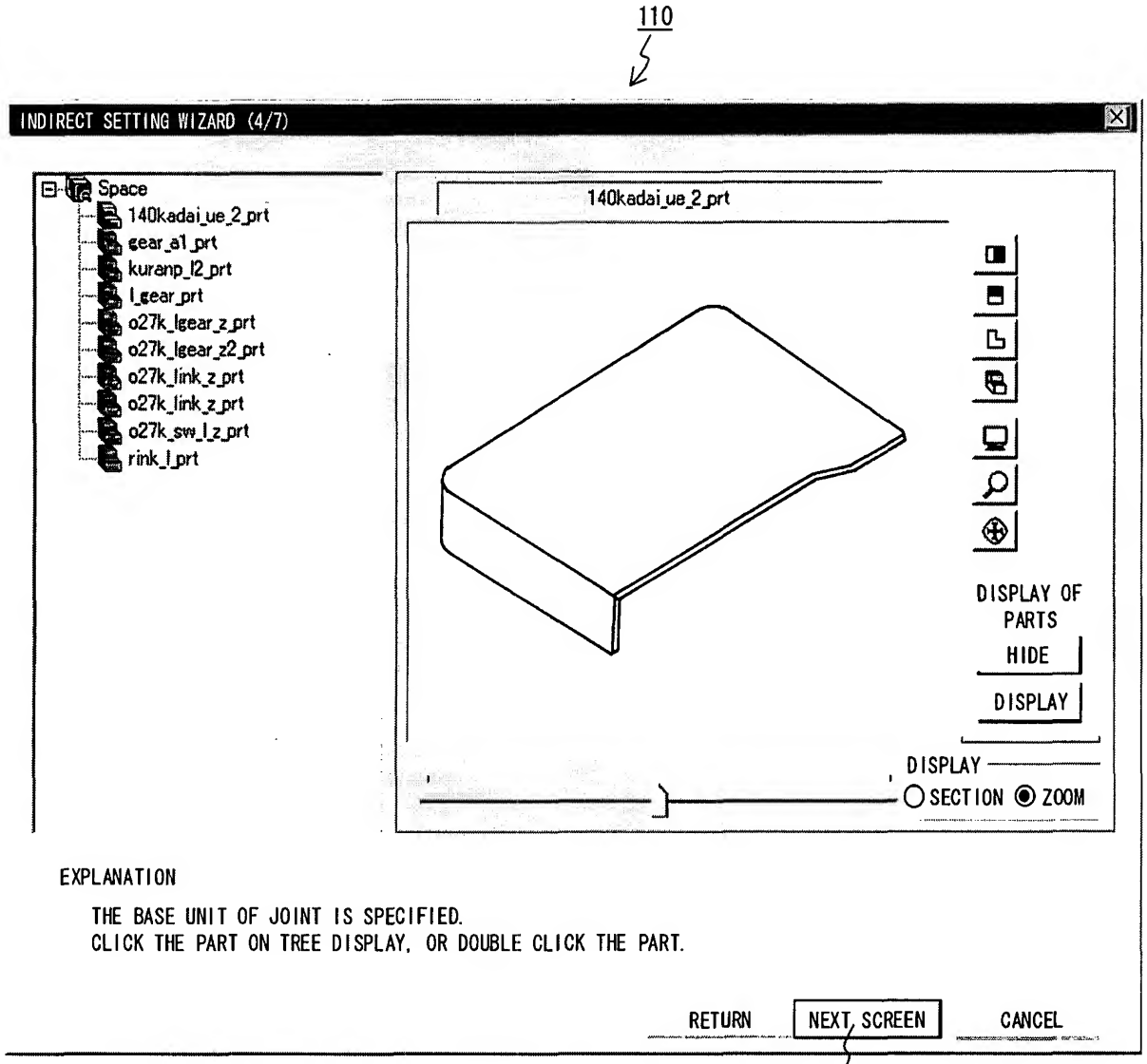
110
INDIRECT SETTING WIZARD (4/7)
Space
140kadai_ue_2_prt
gear_a1_prt
kuranp_l2_prt
l_gear_prt
o27k_lgear_z_prt
o27k_lgear_z2_prt
o27k_link_z_prt
o27k_link_z_prt
o27k_sw_l_z_prt
rink_l_prt
140kadai_ue_2_prt
DISPLAY OF PARTS
HIDE
DISPLAY
DISPLAY
SECTION
ZOOM
EXPLANATION
THE BASE UNIT OF JOINT IS SPECIFIED.
CLICK THE PART ON TREE DISPLAY, OR DOUBLE CLICK THE PART.
RETURN
NEXT SCREEN
CANCEL
111

FIG. 5

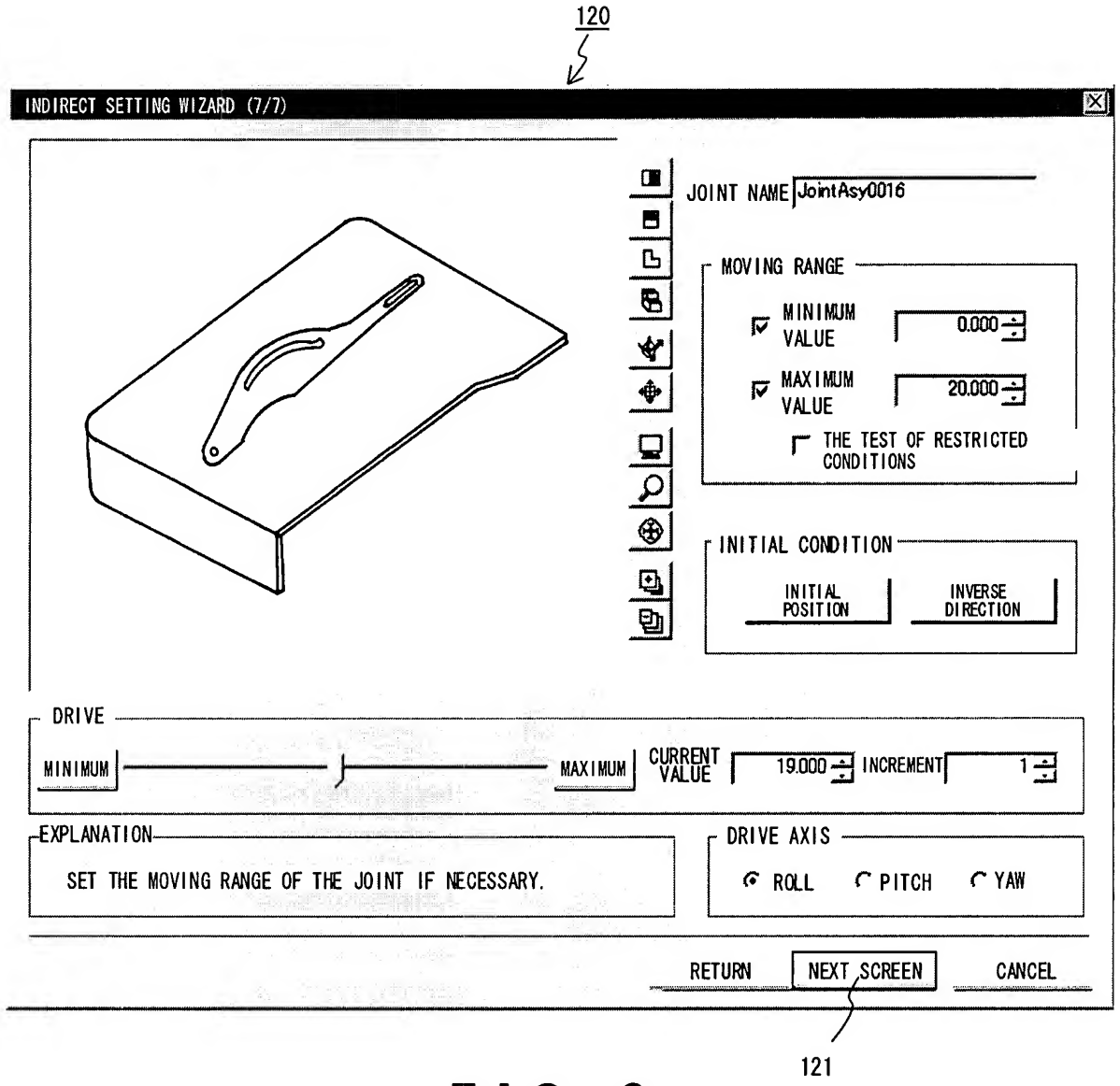
120
INDIRECT SETTING WIZARD (7/7)
JOINT NAME
JointAsy0016
MOVING RANGE
MINIMUM VALUE
0.000
MAXIMUM VALUE
20.000
THE TEST OF RESTRICTED CONDITIONS
INITIAL CONDITION
INITIAL POSITION
INVERSE DIRECTION
DRIVE
MINIMUM
MAXIMUM
CURRENT VALUE
19.000
INCREMENT
1
EXPLANATION
SET THE MOVING RANGE OF THE JOINT IF NECESSARY.
DRIVE AXIS
ROLL
PITCH
YAW
RETURN
NEXT SCREEN
CANCEL
121

FIG. 6

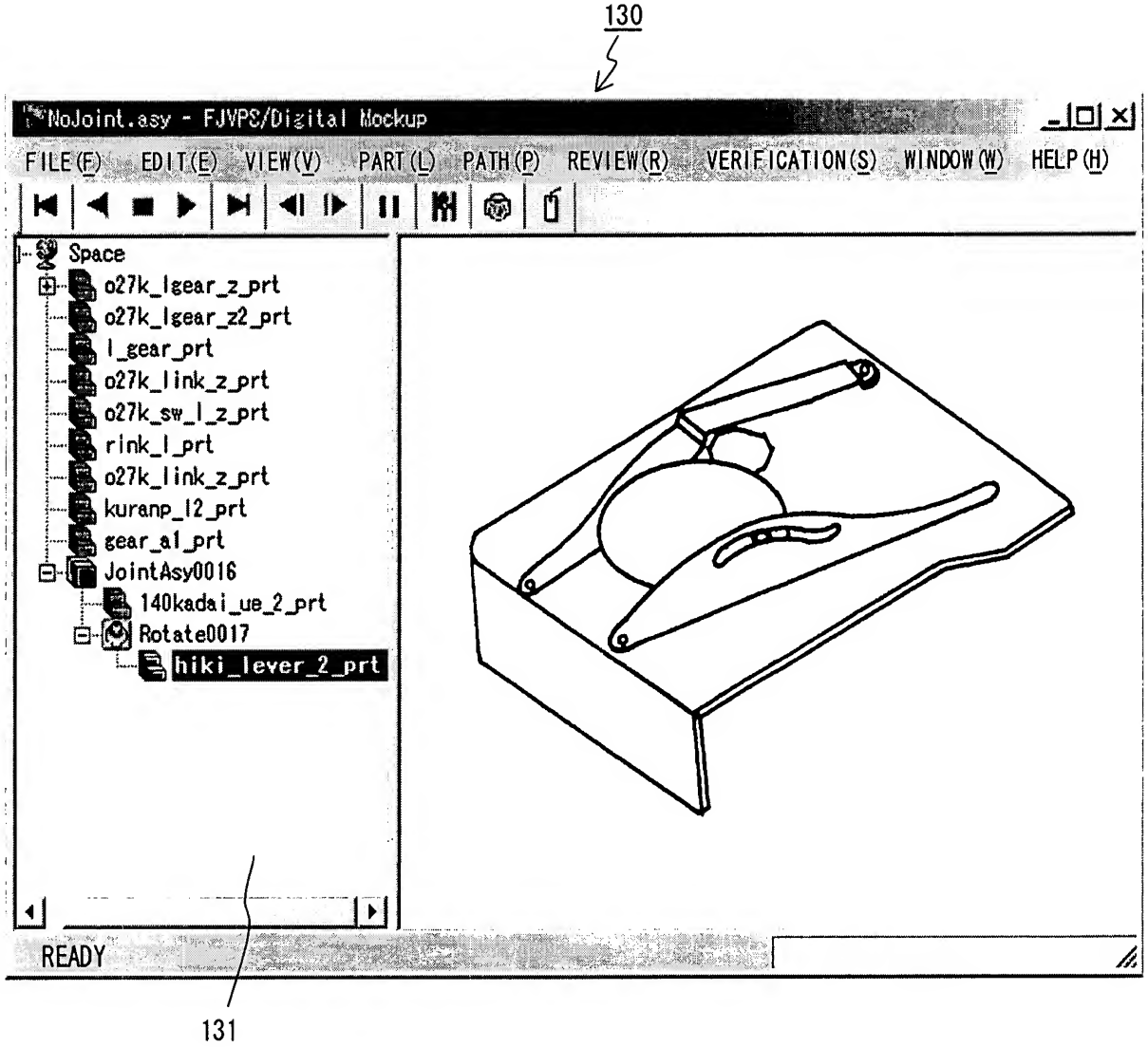
130
NoJoint.asy - FJVPS/Digital Mockup
FILE(F) EDIT(E) VIEW(V) PART(L) PATH(P) REVIEW(R) VERIFICATION(S) WINDOW(W) HELP(H)
Space
o27k_lgear_z_prt
o27k_lgear_z2_prt
l_gear_prt
o27k_link_z_prt
o27k_sw_l_z_prt
rink_l_prt
o27k_link_z_prt
kuranp_l2_prt
gear_a1_prt
JointAsy0016
140kadai_ue_2_prt
Rotate0017
hiki_lever_2_prt
READY
131

FIG. 7

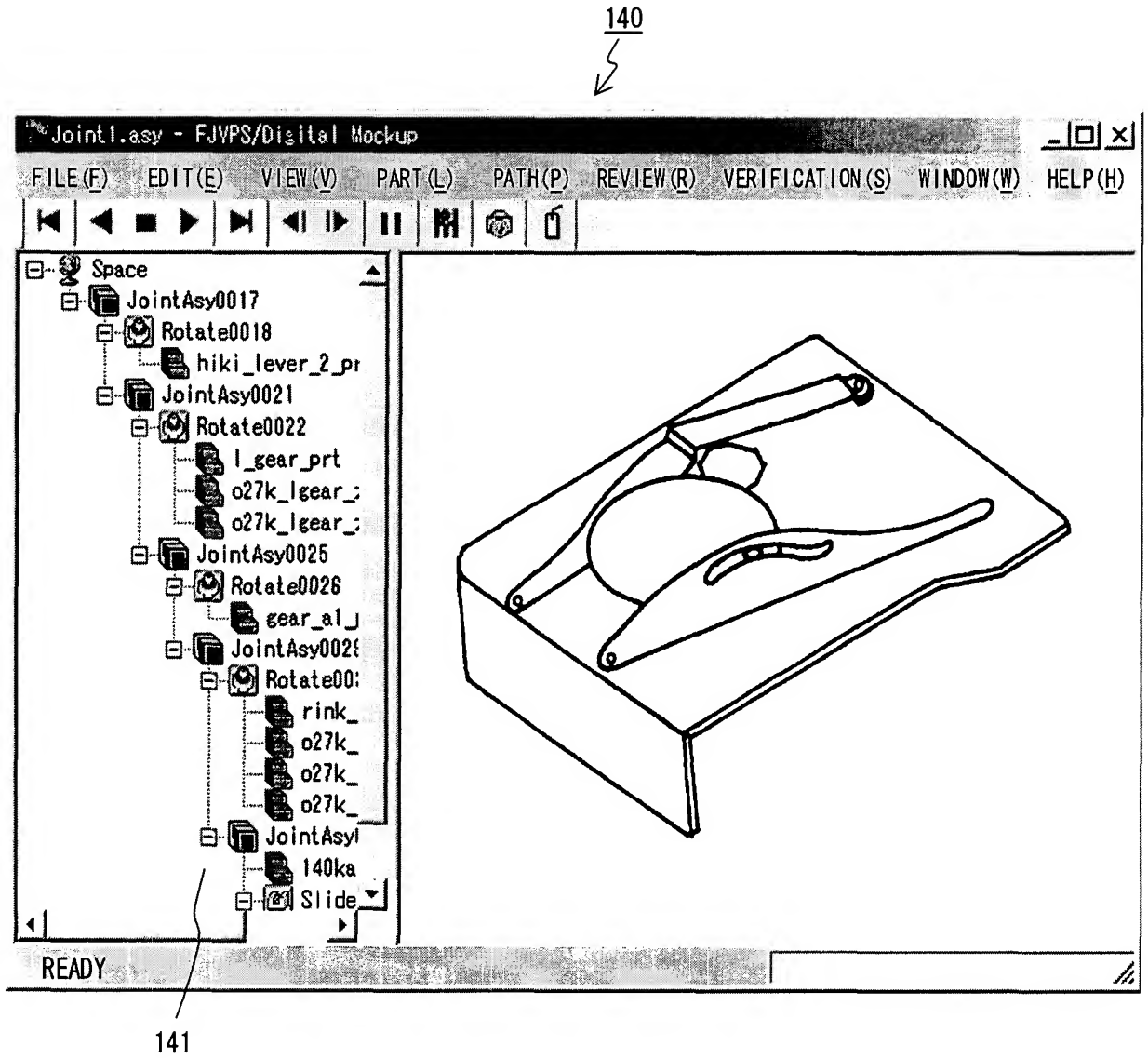
140
Joint1.asy - FJVPS/Digital Mockup
FILE(F) EDIT(E) VIEW(V) PART(L) PATH(P) REVIEW(R) VERIFICATION(S) WINDOW(W) HELP(H)
Space
JointAsy0017
Rotate0018
hiki_lever_2_pr
JointAsy0021
Rotate0022
l_gear_prt
o27k_lgear_
o27k_lgear_
JointAsy0025
Rotate0026
gear_al_
JointAsy002
Rotate00
rink_
o27k_
o27k_
o27k_
JointAsy
140ka
Slide
READY
141

FIG. 8

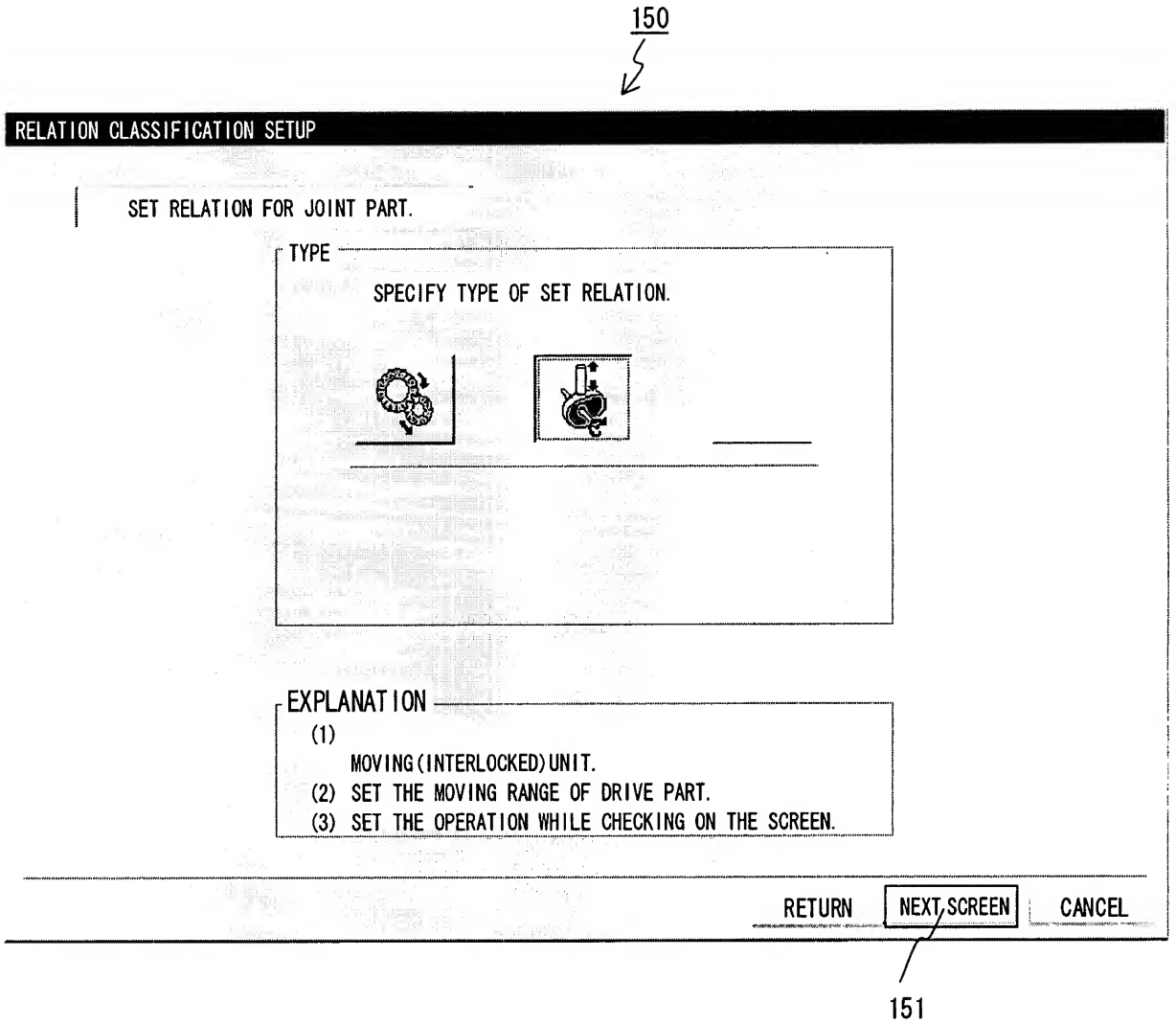
150
RELATION CLASSIFICATION SETUP
SET RELATION FOR JOINT PART.
TYPE
SPECIFY TYPE OF SET RELATION.
EXPLANATION
(1)
MOVING(INTERLOCKED)UNIT.
(2) SET THE MOVING RANGE OF DRIVE PART.
(3) SET THE OPERATION WHILE CHECKING ON THE SCREEN.
RETURN
NEXT SCREEN
CANCEL
151

FIG. 9

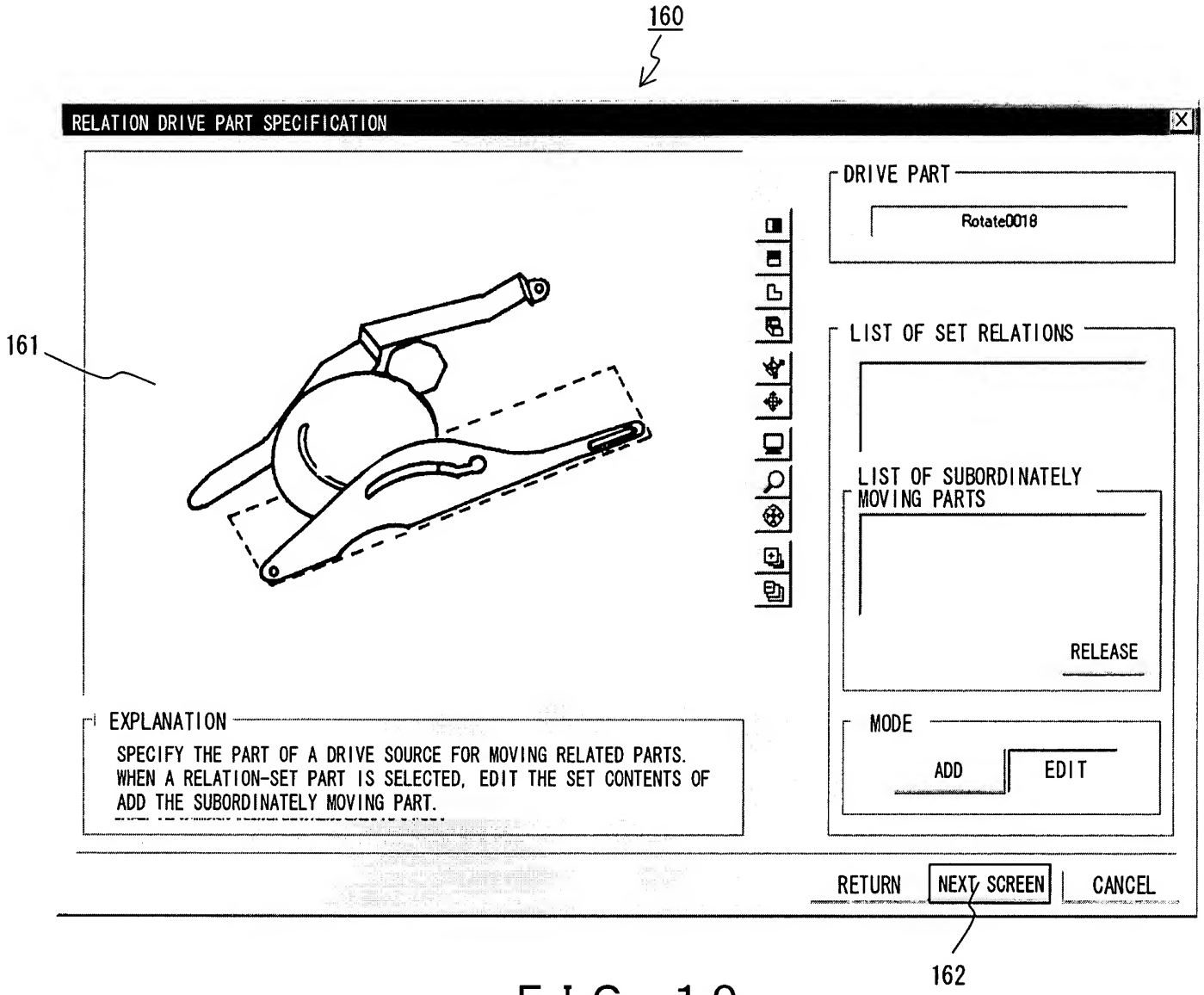
160
RELATION DRIVE PART SPECIFICATION
161
DRIVE PART
Rotate0018
LIST OF SET RELATIONS
LIST OF SUBORDINATELY MOVING PARTS
RELEASE
EXPLANATION
SPECIFY THE PART OF A DRIVE SOURCE FOR MOVING RELATED PARTS. WHEN A RELATION-SET PART IS SELECTED, EDIT THE SET CONTENTS OF ADD THE SUBORDINATELY MOVING PART.
MODE
ADD
EDIT
RETURN
NEXT SCREEN
CANCEL
162

FIG. 10

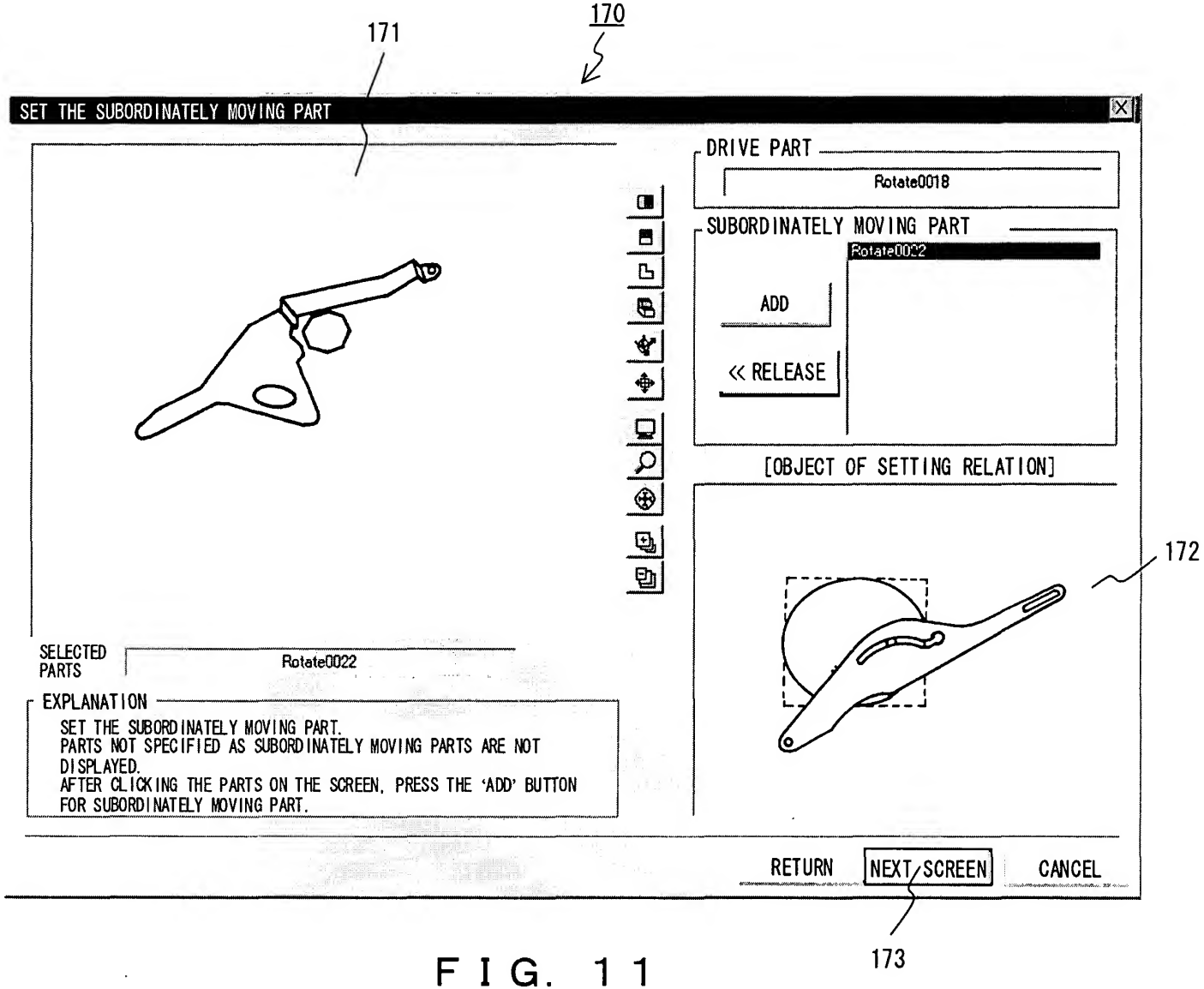
170
171
SET THE SUBORDINATELY MOVING PART
DRIVE PART
Rotate0018
SUBORDINATELY MOVING PART
Rotate0022
ADD
<< RELEASE
[OBJECT OF SETTING RELATION]
172
SELECTED PARTS
Rotate0022
EXPLANATION
SET THE SUBORDINATELY MOVING PART.
PARTS NOT SPECIFIED AS SUBORDINATELY MOVING PARTS ARE NOT DISPLAYED.
AFTER CLICKING THE PARTS ON THE SCREEN, PRESS THE 'ADD' BUTTON FOR SUBORDINATELY MOVING PART.
RETURN
NEXT SCREEN
CANCEL
173

FIG. 11

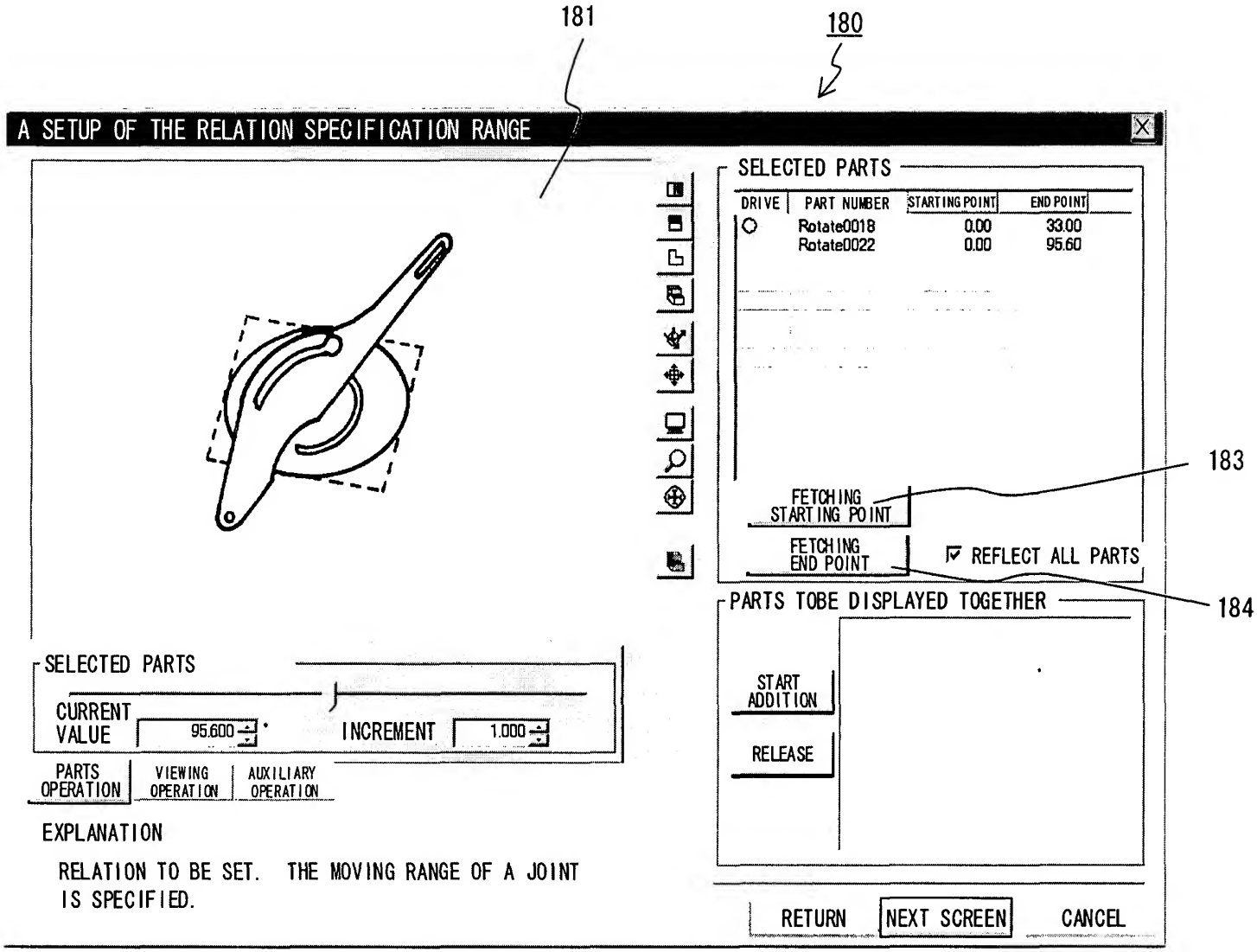
181
180
A SETUP OF THE RELATION SPECIFICATION RANGE
SELECTED PARTS
DRIVE
PART NUMBER
STARTING POINT
END POINT
Rotate0018
0.00
33.00
Rotate0022
0.00
95.60
183
FETCHING STARTING POINT
FETCHING END POINT
REFLECT ALL PARTS
184
PARTS TOBE DISPLAYED TOGETHER
START ADDITION
RELEASE
SELECTED PARTS
CURRENT VALUE
95.600
INCREMENT
1.000
PARTS OPERATION
VIEWING OPERATION
AUXILIARY OPERATION
EXPLANATION
RELATION TO BE SET. THE MOVING RANGE OF A JOINT IS SPECIFIED.
RETURN
NEXT SCREEN
CANCEL

FIG. 12

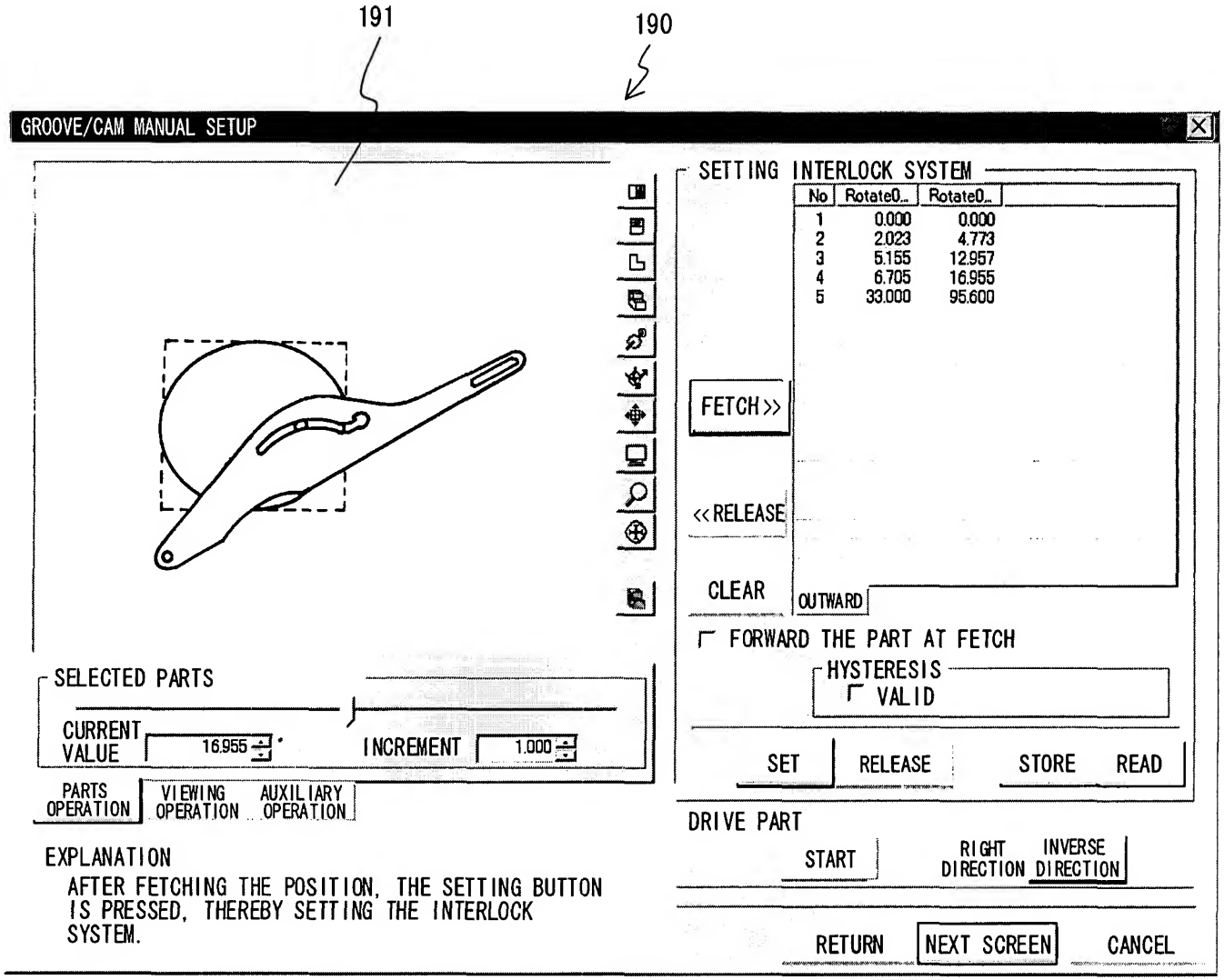
191
190
GROOVE/CAM MANUAL SETUP
SETTING INTERLOCK SYSTEM
No
Rotate0...
Rotate0...
1 0.000 0.000
2 2.023 4.773
3 5.155 12.957
4 6.705 16.955
5 33.000 95.600
FETCH>>
<<RELEASE
CLEAR
OUTWARD
FORWARD THE PART AT FETCH
HYSTERESIS
VALID
SELECTED PARTS
CURRENT VALUE
16.955
INCREMENT
1.000
SET
RELEASE
STORE
READ
PARTS OPERATION
VIEWING OPERATION
AUXILIARY OPERATION
DRIVE PART
START
RIGHT DIRECTION
INVERSE DIRECTION
EXPLANATION
AFTER FETCHING THE POSITION, THE SETTING BUTTON IS PRESSED, THEREBY SETTING THE INTERLOCK SYSTEM.
RETURN
NEXT SCREEN
CANCEL

FIG. 13

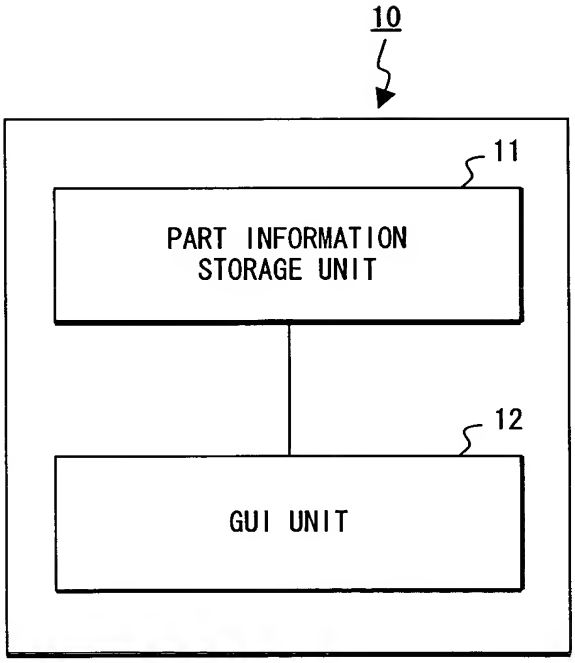

FIG. 14

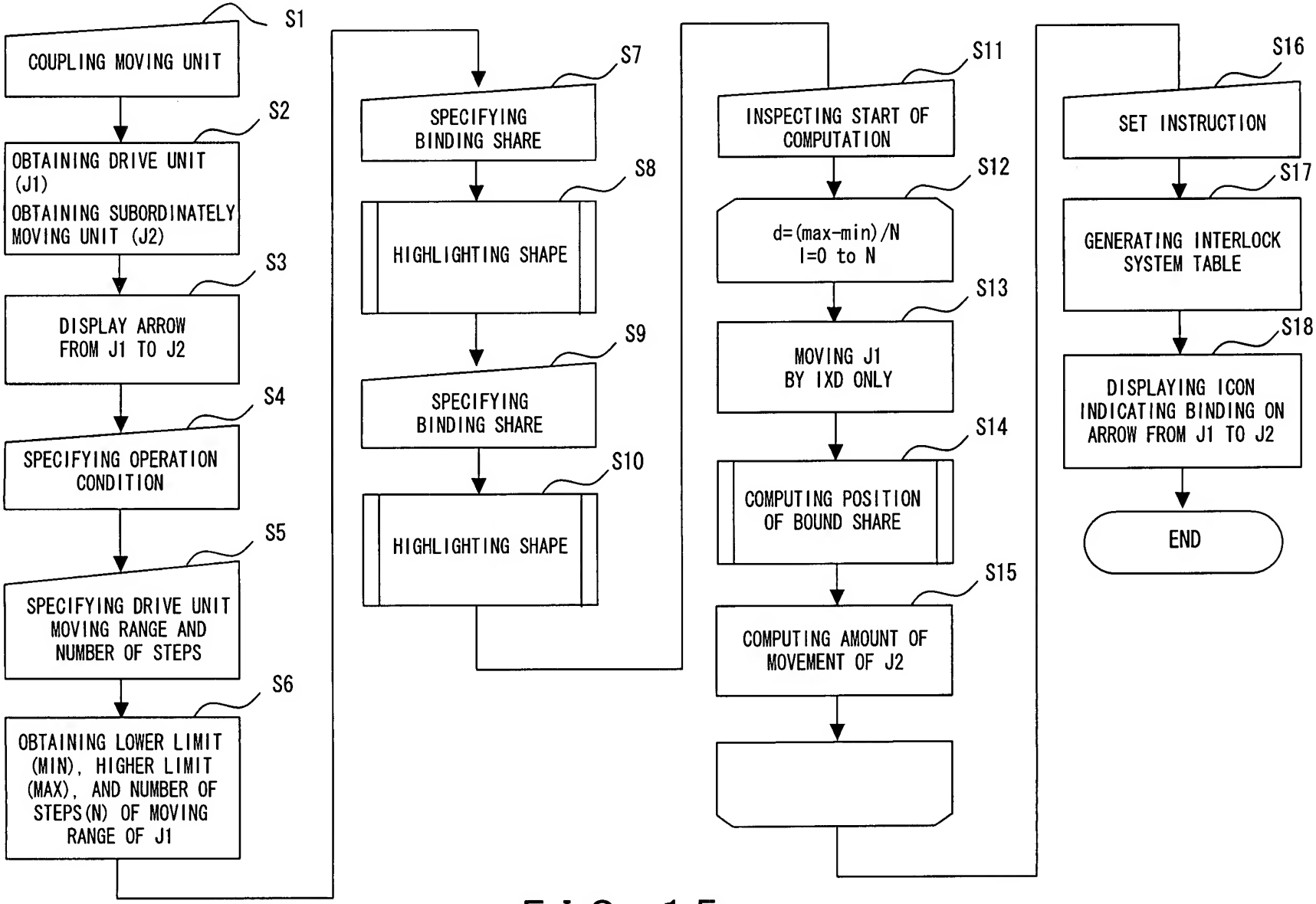
S1
COUPLING MOVING UNIT
S2
OBTAINING DRIVE UNIT (J1)
OBTAINING SUBORDINATELY MOVING UNIT (J2)
S3
DISPLAY ARROW FROM J1 TO J2
S4
SPECIFYING OPERATION CONDITION
S5
SPECIFYING DRIVE UNIT MOVING RANGE AND NUMBER OF STEPS
S6
OBTAINING LOWER LIMIT (MIN), HIGHER LIMIT (MAX), AND NUMBER OF STEPS(N) OF MOVING RANGE OF J1
S7
SPECIFYING BINDING SHARE
S8
HIGHLIGHTING SHAPE
S9
SPECIFYING BINDING SHARE
S10
HIGHLIGHTING SHAPE
S11
INSPECTING START OF COMPUTATION
S12
d=(max-min)/N
I=0 to N
S13
MOVING J1 BY IXD ONLY
S14
COMPUTING POSITION OF BOUND SHARE
S15
COMPUTING AMOUNT OF MOVEMENT OF J2
S16
SET INSTRUCTION
S17
GENERATING INTERLOCK SYSTEM TABLE
S18
DISPLAYING ICON INDICATING BINDING ON ARROW FROM J1 TO J2
END

FIG. 15

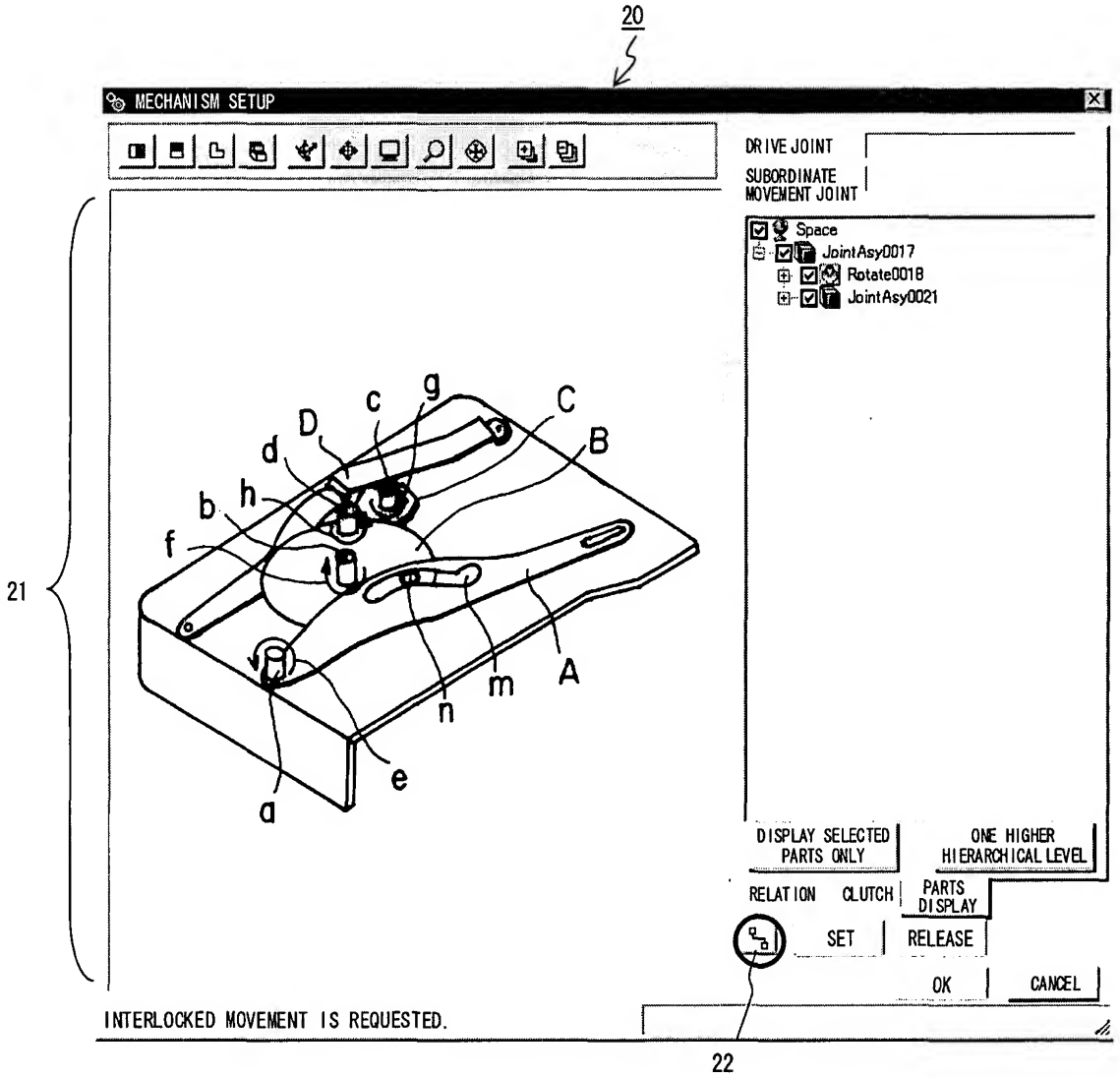
20
MECHANISM SETUP
DRIVE JOINT
SUBORDINATE MOVEMENT JOINT
Space
JointAsy0017
Rotate0018
JointAsy0021
21
D
c
g
C
d
B
b
h
f
m
A
n
e
a
DISPLAY SELECTED PARTS ONLY
ONE HIGHER HIERARCHICAL LEVEL
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
INTERLOCKED MOVEMENT IS REQUESTED.
22

FIG. 16

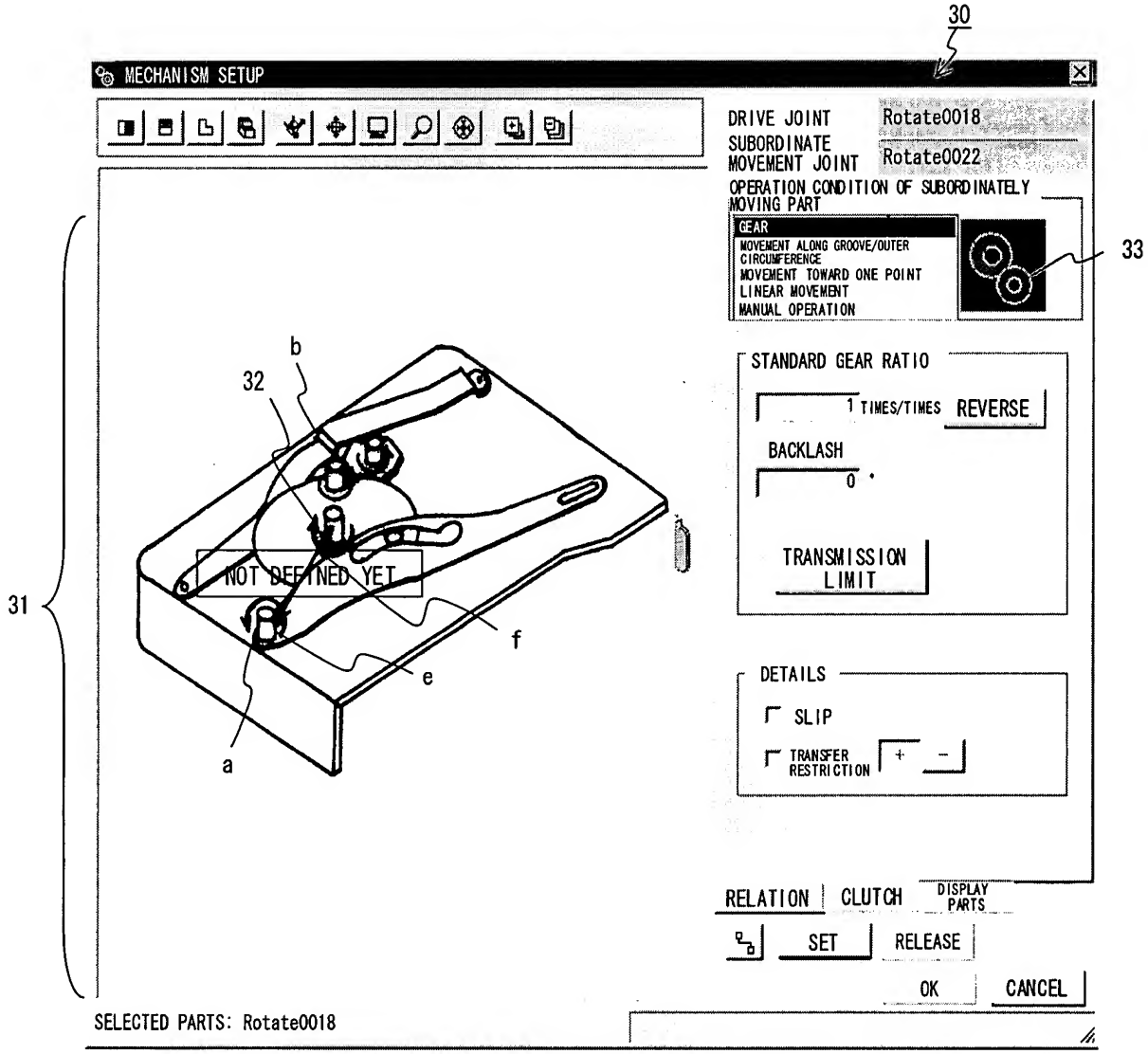
30
MECHANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
33
STANDARD GEAR RATIO
1 TIMES/TIMES
REVERSE
BACKLASH
0 °
TRANSMISSION LIMIT
DETAILS
SLIP
TRANSFER RESTRICTION
+
-
RELATION
CLUTCH
DISPLAY PARTS
SET
RELEASE
OK
CANCEL
SELECTED PARTS: Rotate0018
31
32
b
NOT DEFINED YET
a
e
f

FIG. 17

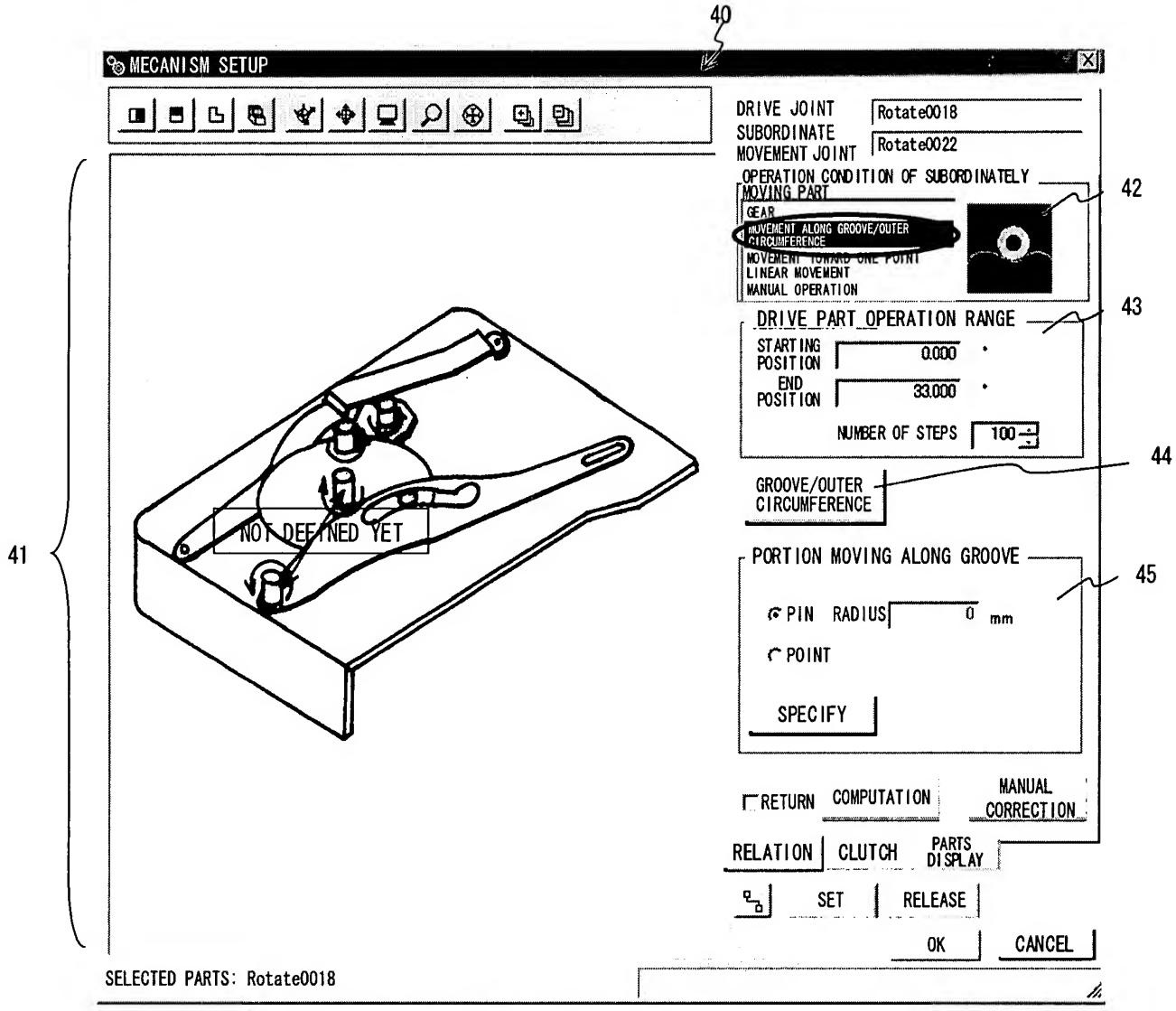
40
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
42
DRIVE PART OPERATION RANGE
43
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
44
GROOVE/OUTER CIRCUMFERENCE
PORTION MOVING ALONG GROOVE
45
PIN RADIUS
0
mm
POINT
SPECIFY
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
41
NOT DEFINED YET
SELECTED PARTS: Rotate0018

FIG. 18

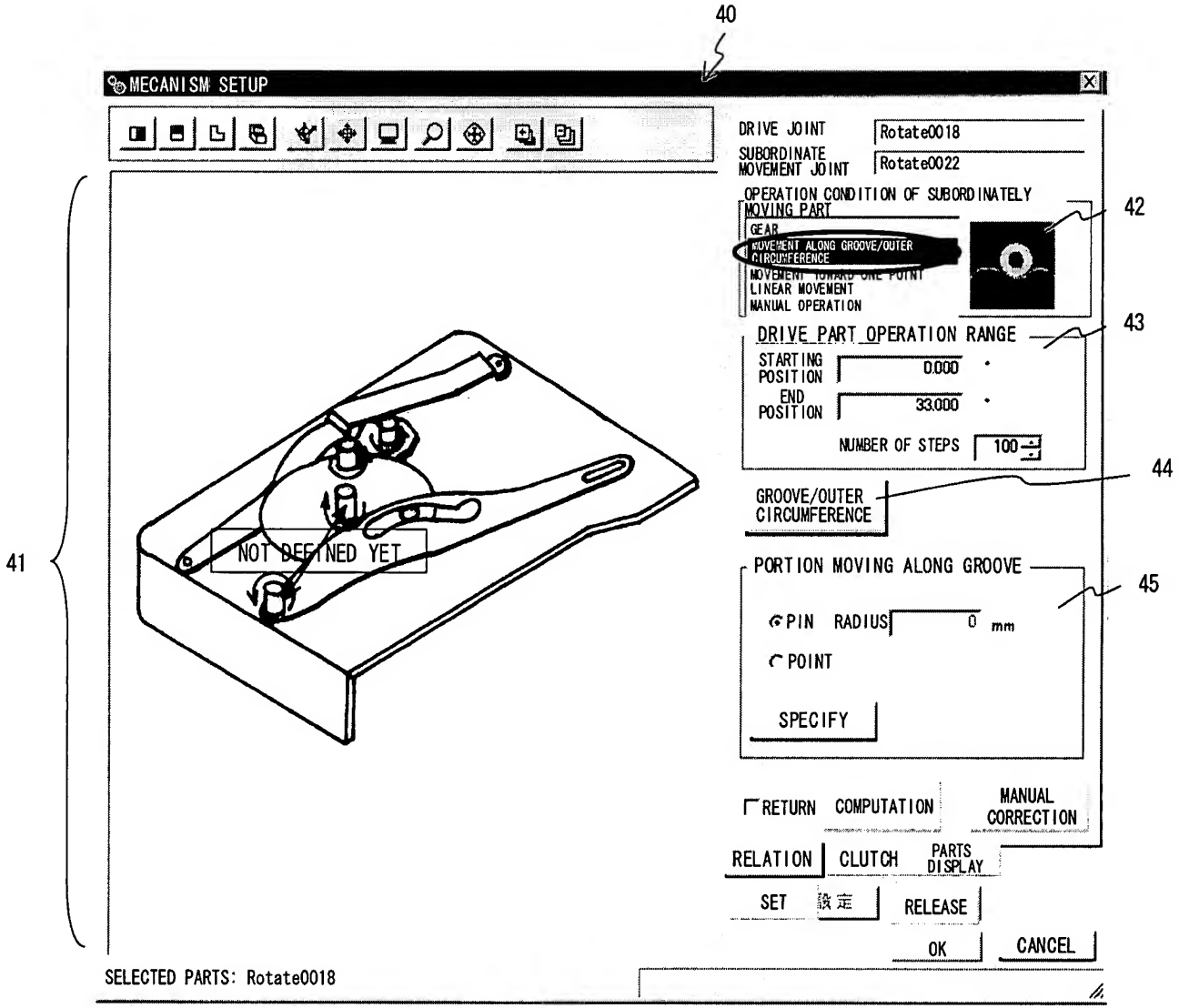
40
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
LINEAR MOVEMENT
MANUAL OPERATION
42
DRIVE PART OPERATION RANGE
43
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
44
GROOVE/OUTER CIRCUMFERENCE
PORTION MOVING ALONG GROOVE
45
PIN RADIUS
0
mm
POINT
SPECIFY
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
設定
RELEASE
OK
CANCEL
41
NOT DEFINED YET
SELECTED PARTS: Rotate0018

FIG. 19

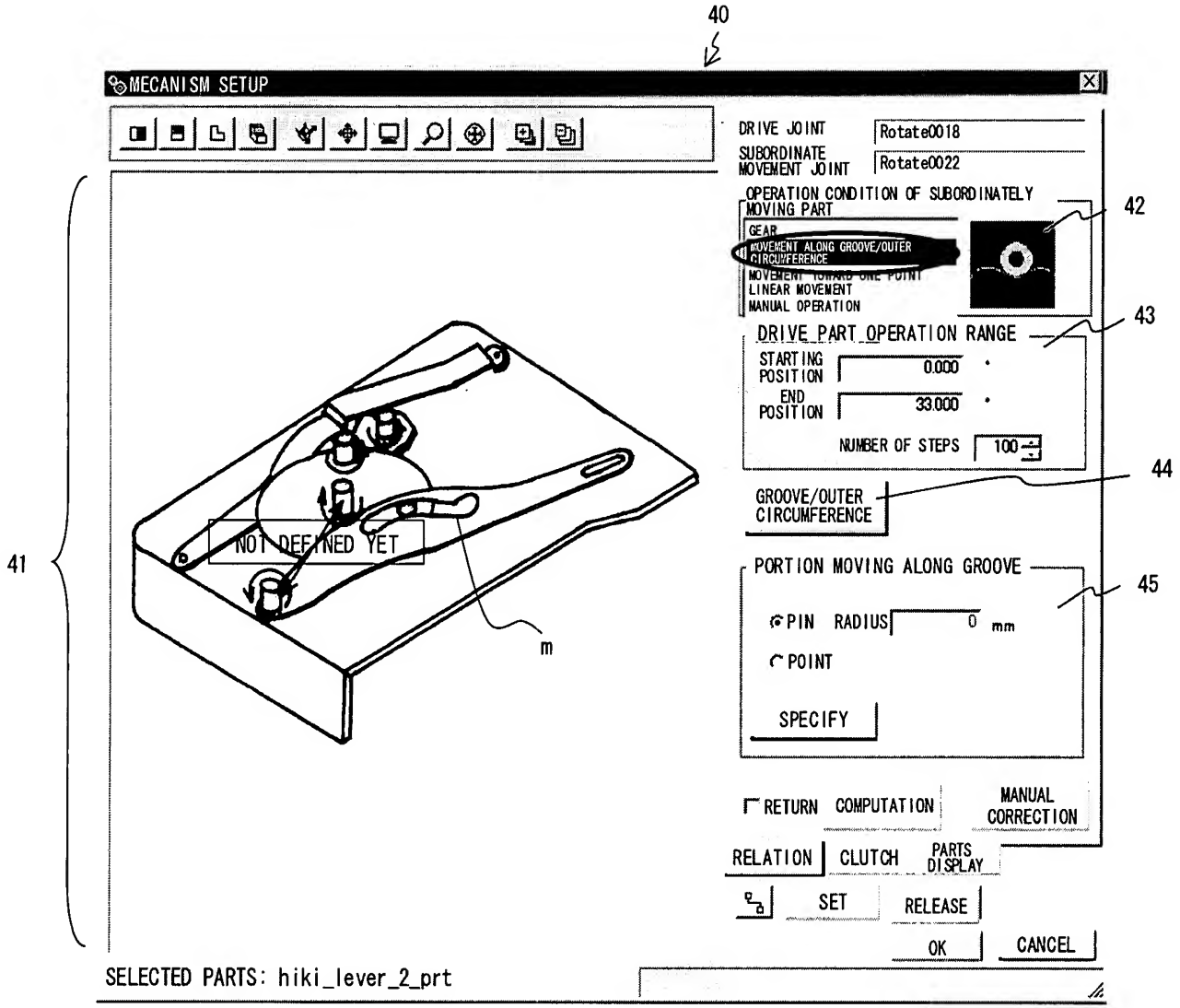
40
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
42
DRIVE PART OPERATION RANGE
43
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
44
GROOVE/OUTER CIRCUMFERENCE
PORTION MOVING ALONG GROOVE
45
PIN
RADIUS
0
mm
POINT
SPECIFY
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
NOT DEFINED YET
m
41
SELECTED PARTS: hiki_lever_2_prt

FIG. 20

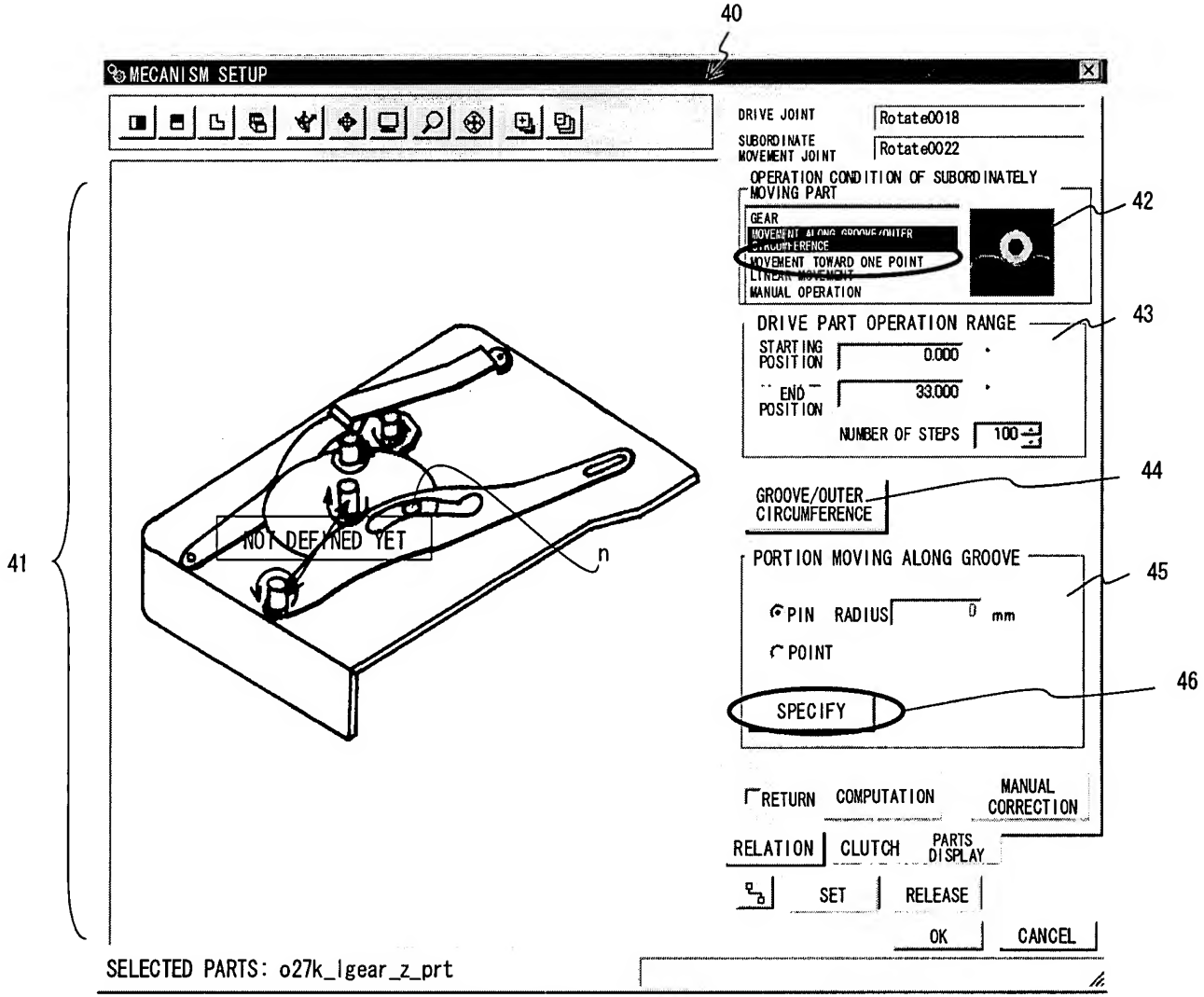
40
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT TOWARD ONE POINT
MANUAL OPERATION
42
DRIVE PART OPERATION RANGE
43
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
GROOVE/OUTER CIRCUMFERENCE
44
PORTION MOVING ALONG GROOVE
45
PIN RADIUS
0
mm
POINT
46
SPECIFY
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
NOT DEFINED YET
n
41
SELECTED PARTS: o27k_lgear_z_prt

FIG. 21

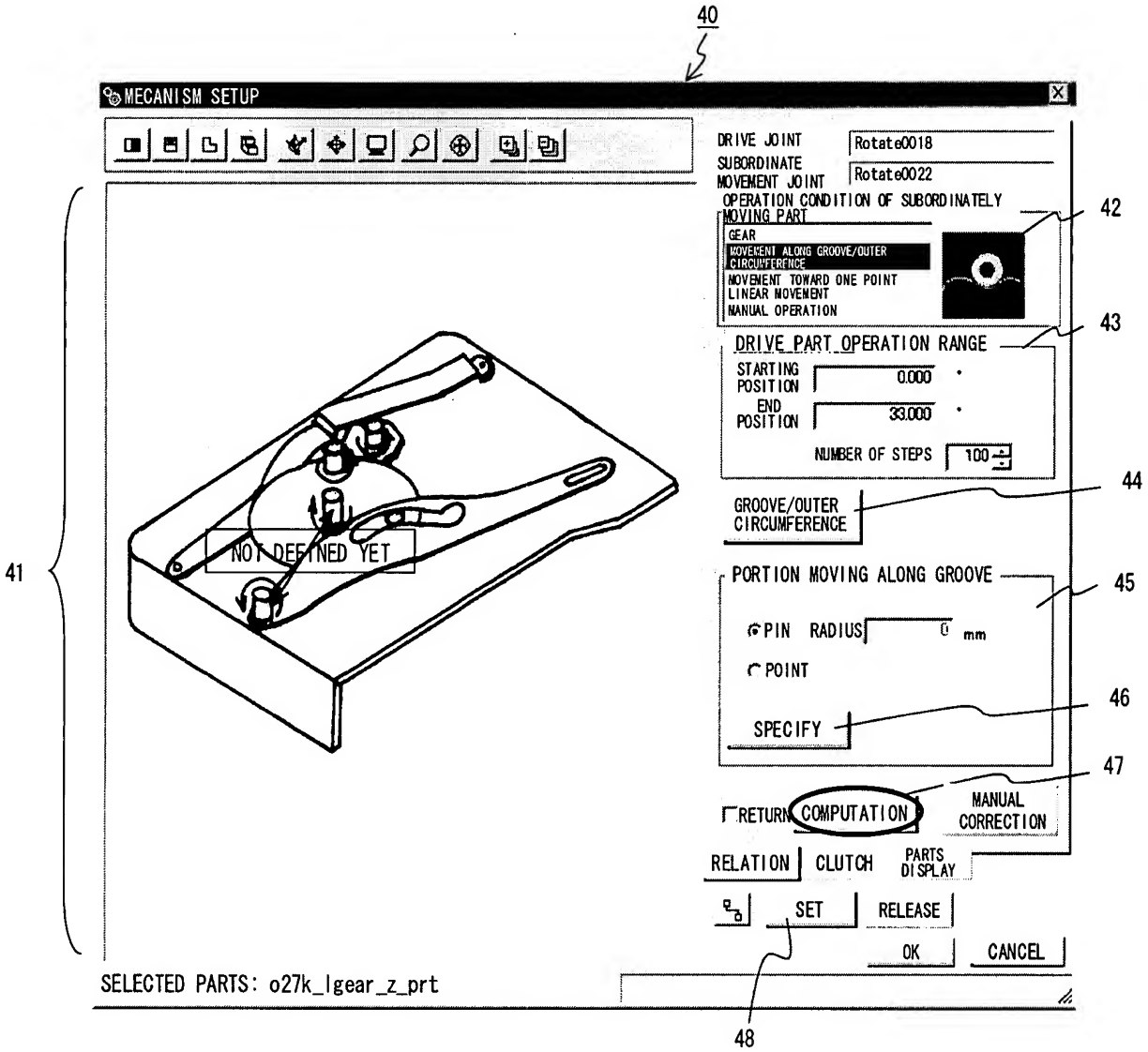
40
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
42
DRIVE PART OPERATION RANGE
43
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
GROOVE/OUTER CIRCUMFERENCE
44
PORTION MOVING ALONG GROOVE
45
PIN RADIUS
0
mm
POINT
SPECIFY
46
47
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
NOT DEFINED YET
41
SELECTED PARTS: o27k_lgear_z_prt
48

FIG. 22

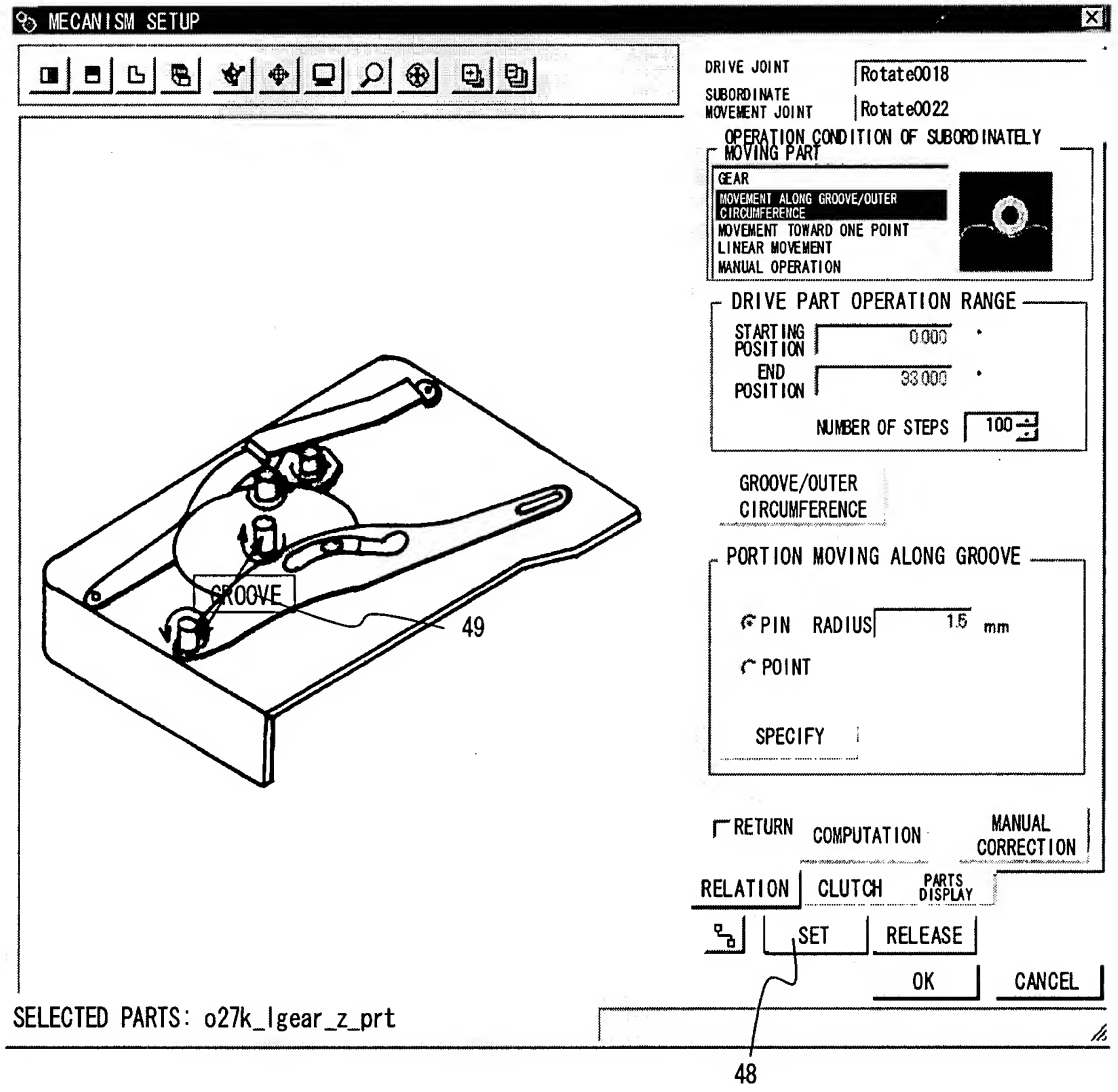
MECANISM SETUP
DRIVE JOINT
Rotate0018
SUBORDINATE MOVEMENT JOINT
Rotate0022
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
DRIVE PART OPERATION RANGE
STARTING POSITION
0.000
END POSITION
33.000
NUMBER OF STEPS
100
GROOVE/OUTER CIRCUMFERENCE
PORTION MOVING ALONG GROOVE
PIN RADIUS
1.5
mm
POINT
SPECIFY
RETURN
COMPUTATION
MANUAL CORRECTION
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
SELECTED PARTS: o27k_lgear_z_prt
GROOVE
49
48

FIG. 23

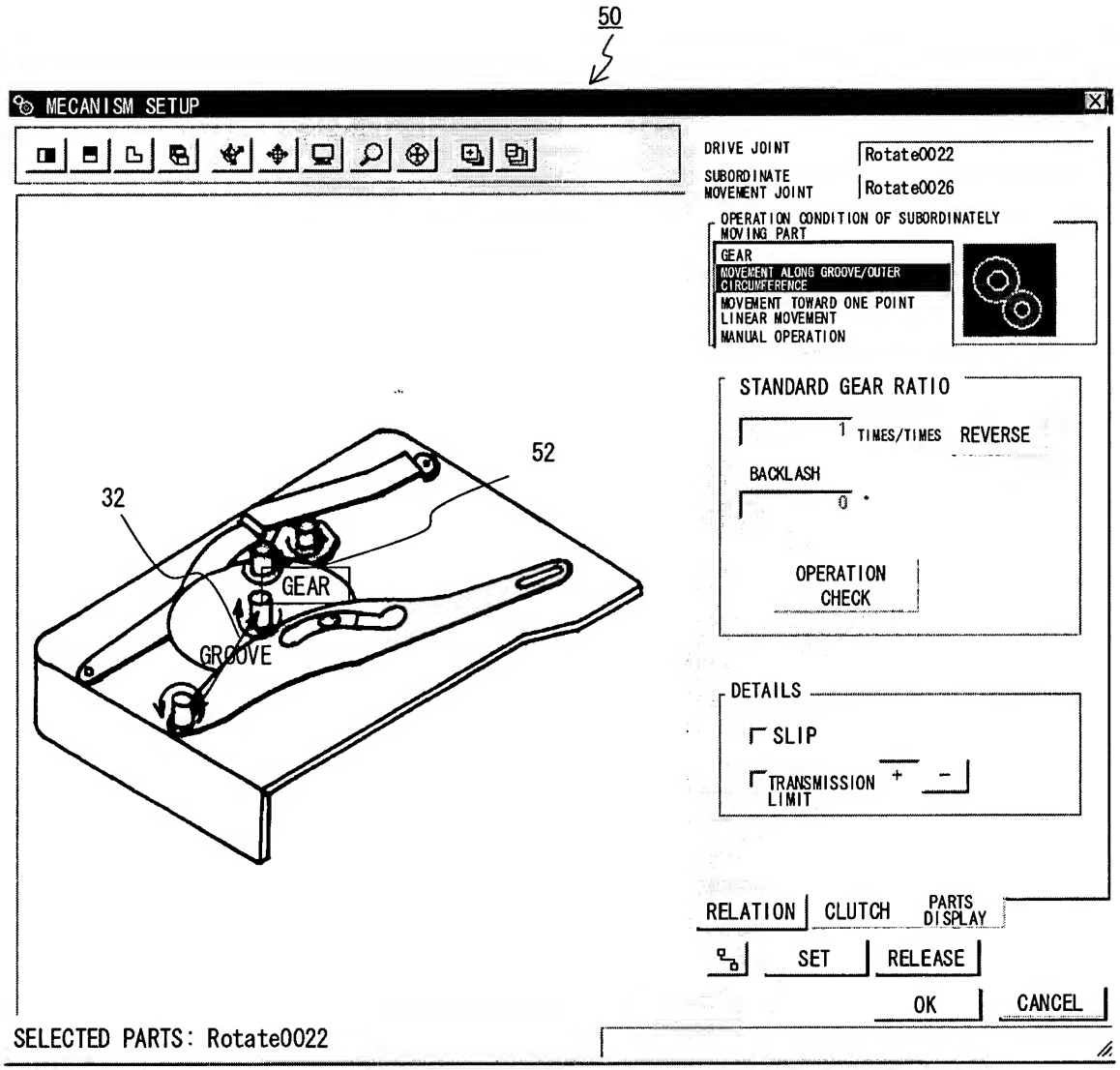
50
MECANISM SETUP
DRIVE JOINT
Rotate0022
SUBORDINATE MOVEMENT JOINT
Rotate0026
OPERATION CONDITION OF SUBORDINATELY MOVING PART
GEAR
MOVEMENT ALONG GROOVE/OUTER CIRCUMFERENCE
MOVEMENT TOWARD ONE POINT
LINEAR MOVEMENT
MANUAL OPERATION
STANDARD GEAR RATIO
1
TIMES/TIMES
REVERSE
BACKLASH
0
OPERATION CHECK
DETAILS
SLIP
TRANSMISSION LIMIT
+
-
RELATION
CLUTCH
PARTS DISPLAY
SET
RELEASE
OK
CANCEL
SELECTED PARTS: Rotate0022
32
52
GEAR
GROOVE

FIG. 24

MOVING UNIT A	MOVING UNIT B
0.00	-0.06
0.01	-0.03
0.02	0.00
0.03	0.03
:	:

FIG. 25A

MOVING UNIT B	MOVING UNIT C
0.00	0.00
0.01	0.01
0.02	0.02
0.03	0.03
:	:

FIG. 25B

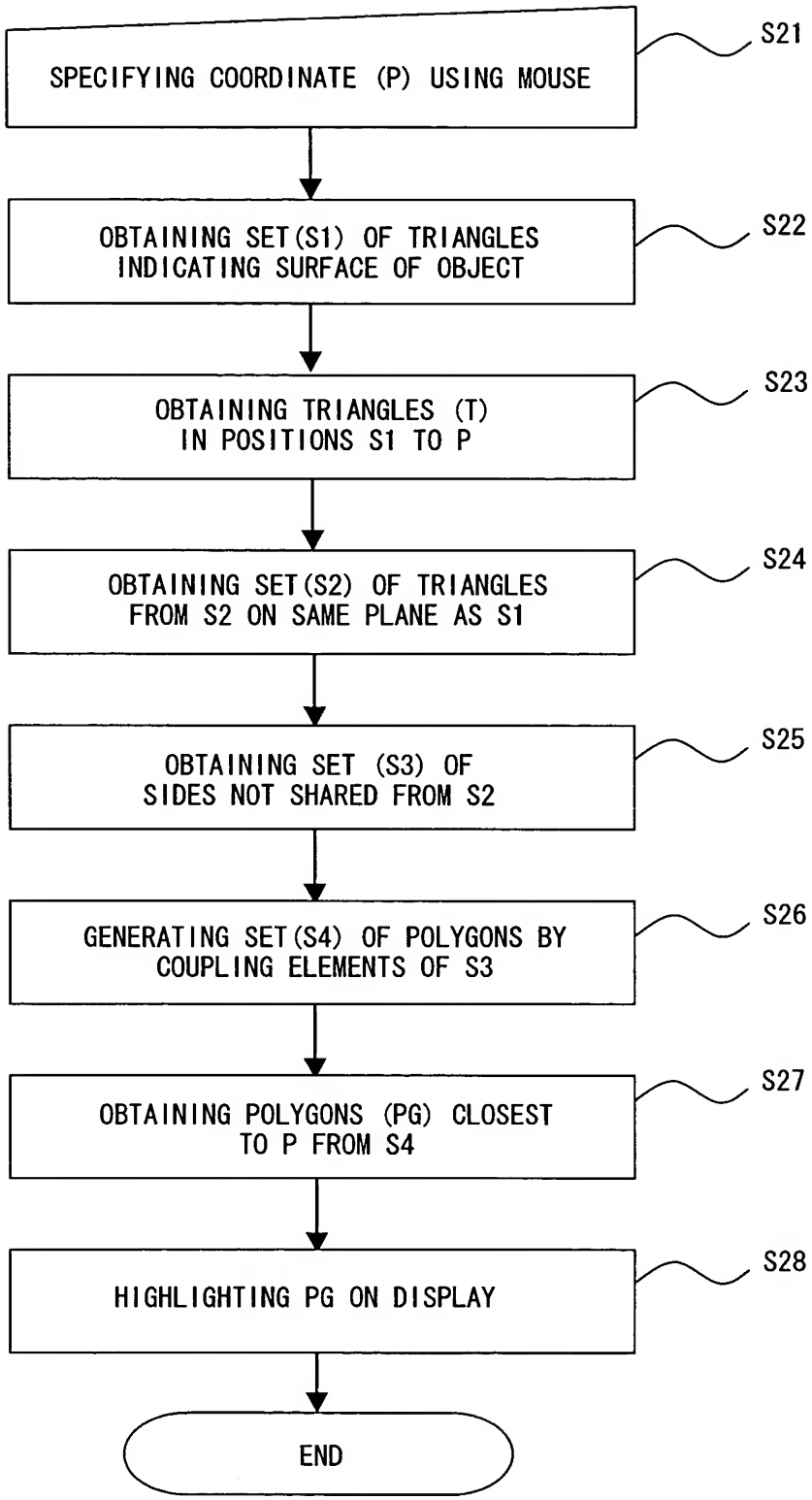
SPECIFYING COORDINATE (P) USING MOUSE
S21
OBTAINING SET(S1) OF TRIANGLES INDICATING SURFACE OF OBJECT
S22
OBTAINING TRIANGLES (T) IN POSITIONS S1 TO P
S23
OBTAINING SET(S2) OF TRIANGLES FROM S2 ON SAME PLANE AS S1
S24
OBTAINING SET (S3) OF SIDES NOT SHARED FROM S2
S25
GENERATING SET(S4) OF POLYGONS BY COUPLING ELEMENTS OF S3
S26
OBTAINING POLYGONS (PG) CLOSEST TO P FROM S4
S27
HIGHLIGHTING PG ON DISPLAY
S28
END

FIG. 26

DATA STRUCTURE OF SHAPE DATA

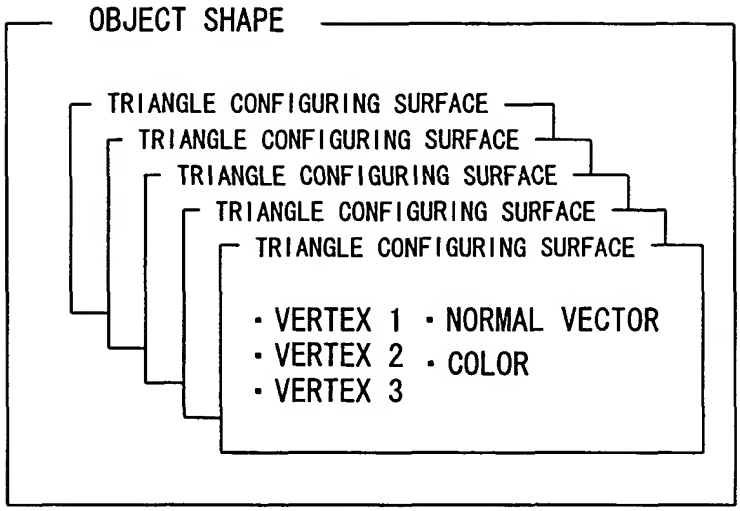

FIG. 27A

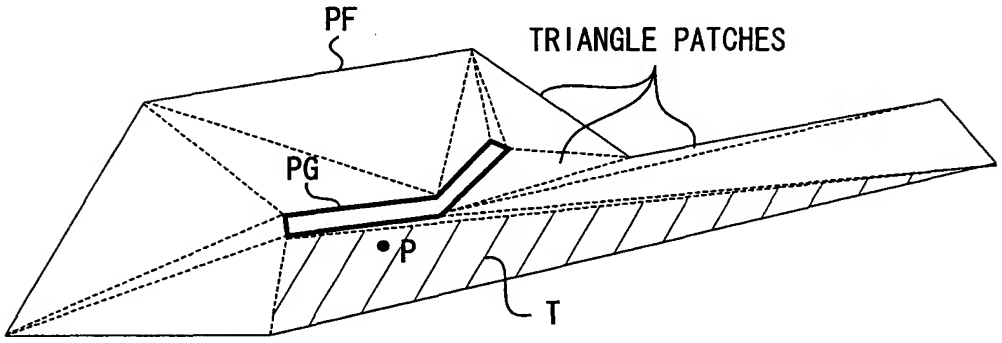

FIG. 27B

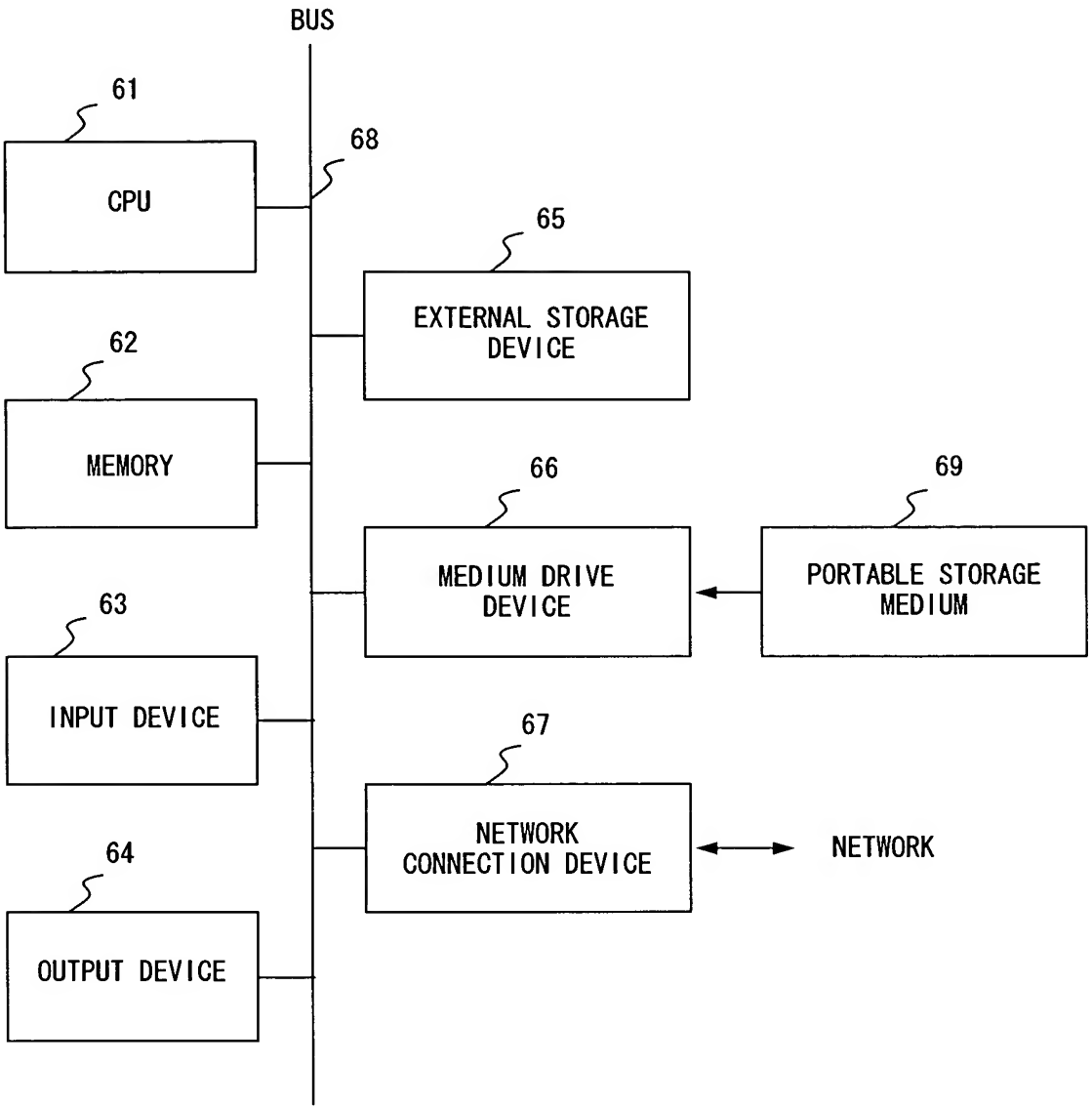
BUS
61
CPU
68
65
EXTERNAL STORAGE DEVICE
62
MEMORY
66
69
MEDIUM DRIVE DEVICE
PORTABLE STORAGE MEDIUM
63
INPUT DEVICE
67
NETWORK CONNECTION DEVICE
NETWORK
64
OUTPUT DEVICE

FIG. 28

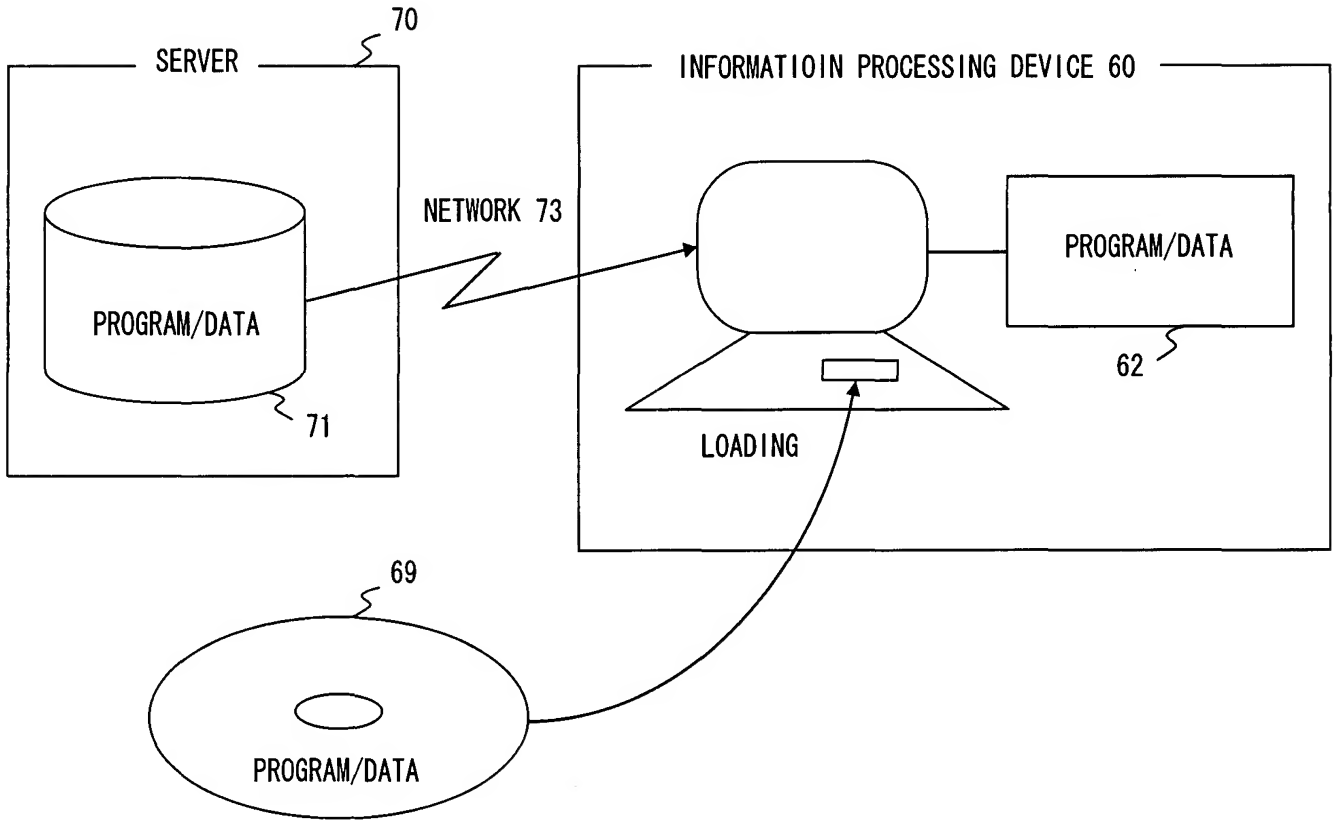
70
SERVER
INFORMATIOIN PROCESSING DEVICE 60
NETWORK 73
PROGRAM/DATA
71
PROGRAM/DATA
62
LOADING
69
PROGRAM/DATA

FIG. 29